New Series for Garagemen Begins on Page 18

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MOTOR AGE

Volume XXXV
Number 9

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, FEBRUARY 27, 1919

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Three Dollars a Year

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Its Praise Means Profits

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So many motorists running into thousands the first week—have signed orders for the new Essex that waiting lists have had to be established. The unusual reception given the Essex has surprised even Essex dealers who had run and driven the car.

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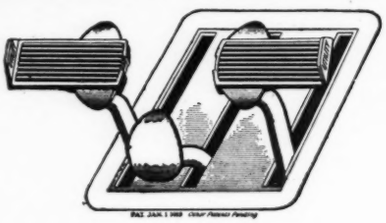
Automotive Products

UTILITY For Fords



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Get Ready Now for Spring

Now is the time to look over your cars and see what they need for spring.

If you own a Ford—or if you are a dealer and there are Fords in your shop—before the new season begins they should be equipped with UTILITY Pedals for safety.

UTILITY Pedals transform the small, smooth Ford clutch and brake pedals into standard size, comfortable foot rests. The driver's feet absolutely cannot slip off. The heavy rubber pad and flange at the sides prevent all possibility of losing control, even in rainy weather when shoes are wet.

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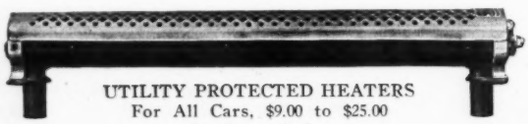

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For All Cars, $9.00 to $25.00

MOTOR AGE

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING
59 E. Madison St., CHICAGO

HORACE M. SWETLAND, *Pres.* W. I. RALPH, *Vice-Pres.*
E. M. COREY, *Treas.* A. B. SWETLAND, *Gen. Mgr.*

Member Audit Bureau of Circulations; Member Assoc. Business Papers, Inc.

Vol. XXXV Chicago, February 27, 1919 No. 9

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MOTOR AGE

MALLERS BUILDING **Phone Randolph 6960**
CHICAGO **Cable Address "Motage"**

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SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions..$3.00 per year
Canada ..... 5.00 per year
All Other Countries in Postal Union..... 6.00 per year
Single Copies .....15 cents

Entered as second-class matter, September 19, 1899, at the Post Office, Chicago, Illinois, under Act of March 3, 1879.

Owned by UNITED PUBLISHERS CORPORATION, 243 W. 39th St., New York, H. M. Swetland, Pres.; Charles S. Phillips, Vice-Pres.; W. H. Taylor, Treas.; A. C. Pearson, Secretary.

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National SPARK PLUGS

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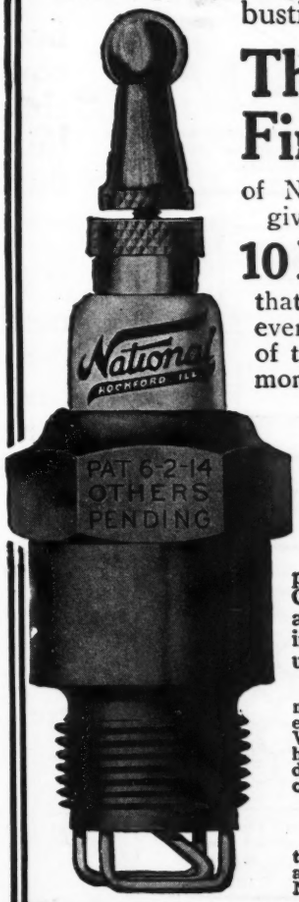

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10 Hot, Fat Sparks

that ignite every charge of every cylinder and burn up all of the fuel and carbon, giving more power, quicker acceleration, complete combustion, a smoother running engine, and great economy of fuel.

The NATIONAL is unequaled for Heavy Duty and Continuous Service—for Aeroplanes, Marine Motors, Motor Cars, Trucks, Tractors, Stationary Engines and every type of internal combustion engine that uses spark plugs.

NATIONAL SPARK PLUGS are made in all sizes—to fit any motor—for every requirement of Air, Land and Water Service. Rigid competitive tests have proved their superiority in service, dependability, durability, and economy of fuel. Price $1 at all reliable dealers.

Write for Booklet

that gives details of construction, sizes and complete information about the NATIONAL—Big Power—Spark Plugs.

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303 East State Street Rockford, Illinois

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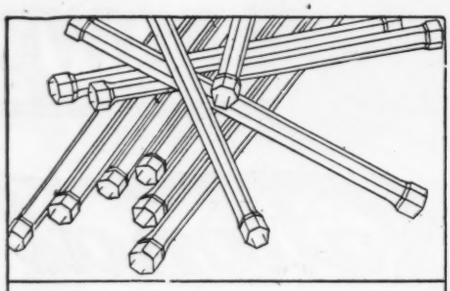
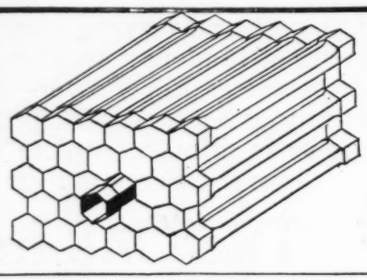
FEDDERS

GENUINE HONEYCOMB RADIATORS

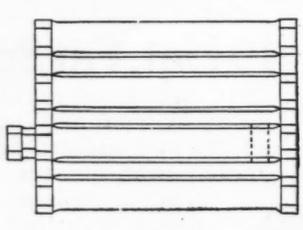
For Passenger Cars, Trucks and Tractors



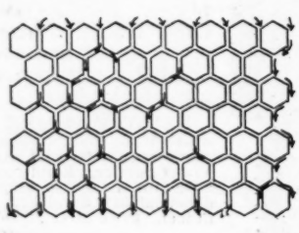
The core is composed of a plurality of individual tubes placed in a horizontal position.



They are joined at their expanded ends and create absolutely uniform circulating space around and between the tubes.



Showing how any tubes may be extracted and replaced without disturbing the others.



Water passes completely around each tube; all cooling surfaces come into direct contact with water on one side and air on the other. (Pat. No. 764727)

This is the Radiator that was proven by American, English and French engineers to be unequaled in Cooling Efficiency, Durability and Ease of Repair. These facts were officially recognized, and

The United States Government specified that all airplanes must be so equipped. At Government request, we cheerfully permitted the manufacture of this type by others under our patents during the period of the war only.

Refinements in our machinery and methods of production enable us to resume the manufacture of improved Fedders **Genuine Honeycomb** Radiators for civil use on a larger and much more economical basis than ever in the past.

We now offer this famous type of radiator at a price well within the reach of car builders willing to pay a slight difference for a Radiator that is universally conceded to have **no equal.**

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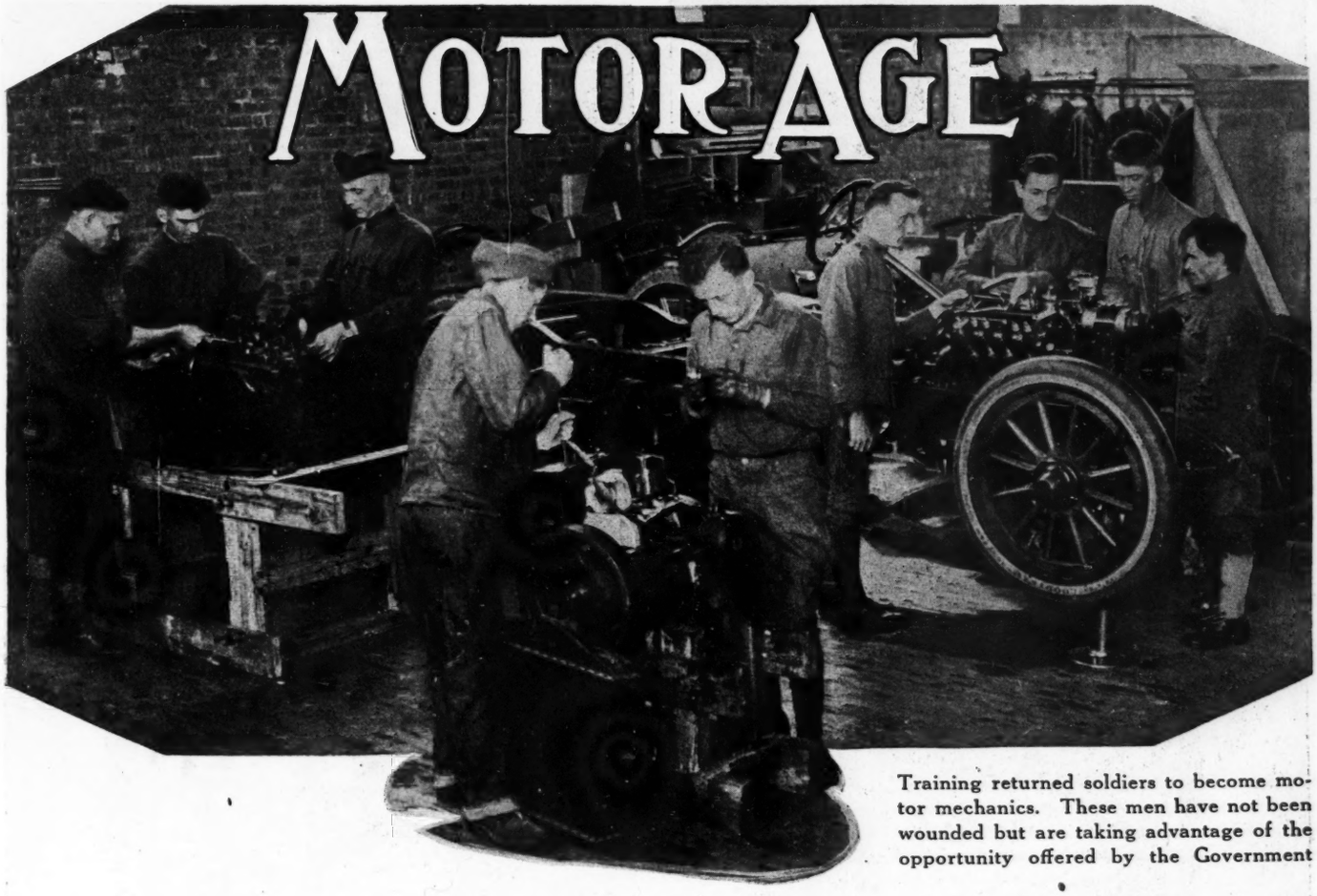
Buffalo, N. Y.

Vol. XXXV, No. 9 Chicago, February 27, 1919 $3.00 Per Year

MOTOR AGE



Training returned soldiers to become motor mechanics. These men have not been wounded but are taking advantage of the opportunity offered by the Government

Training Soldiers as Mechanics

Future Supply for Skilled Help in Repair-shop and Garage Is Developed by Army

Motor Age presents this article for the benefit of its dealer-readers. Not only is there a vast opportunity for the garage and repairshop, including the service station proper, in the supply of skilled labor thus made, but herein lies a moral for the training of the dealer's own unskilled labor. What the Army is doing on a vast scale, many dealers and repairmen have done on a small scale during the war, when skilled labor has been so scarce. The whole industry is going to benefit. Hence, if there is anything a dealer can do to further the instruction of soldiers or workers from his row, it is to his own interest and that of his industry to do it.—Editor.

By Roy E. Berg

Motor Age Editorial Staff

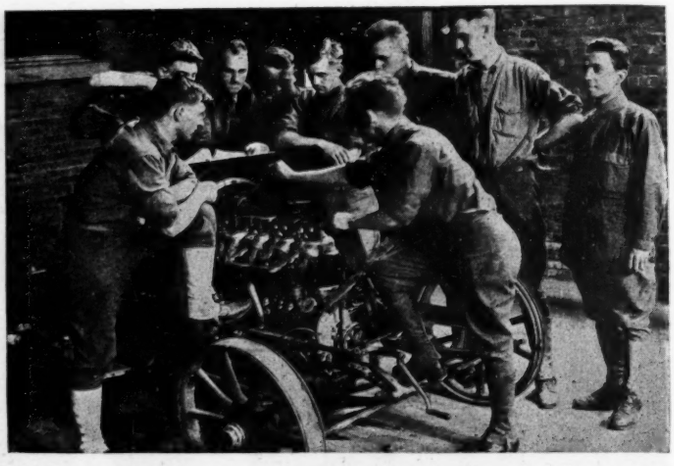
FORTY-SEVEN per cent of the soldiers being re-educated so they may return to civilian life unhandicapped are being taught some subject that pertains to the automotive industry. The other 53 per cent have their choice distributed between forty-two subjects. More than half the 47 per cent have expressed a desire for the maintenance and repair part of the business. This immediately brings us to a classification of the industry into two parts: The class which constructs and the class which maintains. Of the 47 per cent now studying subjects which concern the industry as a whole more than half are studying the maintenance and repair, and most of these are general motor mechanics.

The Government's appreciation of the soldiers and sailors is expressed in the interest taken to train the men and so equip them that they can command a higher wage than they received in pre-war days. The wounded soldier is, of course, the first to be taken care of. His case is the most serious, it requires more time to solve his problem, because he in many cases cannot step into any position and hope to meet the requirements. His physical condition will not permit this. After careful training, however, he will be able to compete in some trade with the ones not wounded.

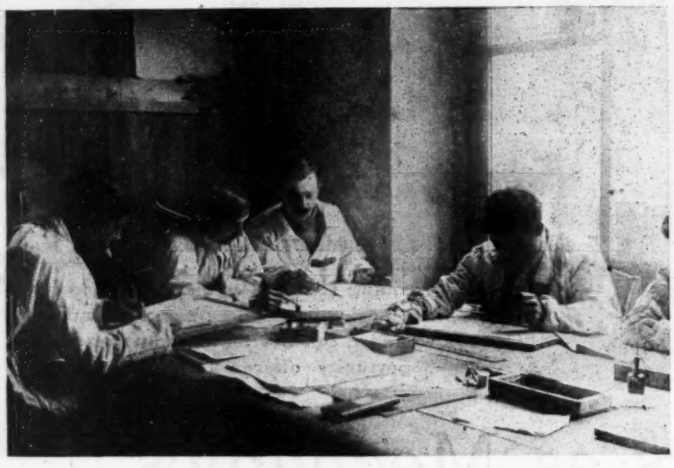
Timing the valves on an engine

It is a delicate matter to determine what class of training the soldier or sailor should have. Choice in the matter must be catered to as much as possible. When one wants to become a gas engine draughtsman and he has but one hand it becomes necessary to resort to new methods of instruction. The wounded and disabled cases, though, form a small percentage of the total being trained

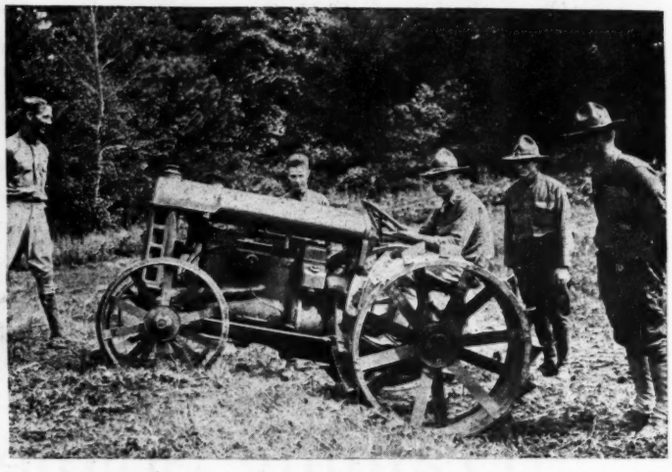
Open air schools are established in places where the climatic conditions will build up the men



These men are studying the principles of ignition, probably the reason for the intent looks on their faces.



Crippled French soldiers who have become efficient draughtsmen with the aid of instruments



American soldiers in Plainfield, N. J., studying tractor operation

in the schools, and these cases are handled mostly in special schools.

The school at Fort Sheridan probably will become the largest in the country. This spring it will have facilities to handle several thousand men. It is under the direction of Maj. Fred P. Reagle. The subject that interests most of the men at this post is motor car repair.

The building which houses the school is a former mess hall, and it is equipped to turn out the men with a thorough knowledge of many different motor cars. An arrangement has been made whereby the Chicago Automobile Trade Association will furnish cars, and these will be completely overhauled and repaired without charge. If new parts are furnished, the cost of the parts will be the only expense, and the owner can furnish the parts or the school will supply them at cost. It is not planned to turn out these cars at a very rapid rate. It is considered better practice to do a very thorough job and investigate the construction of each part of the car. This will make the men familiar with details that can be learned in no other way.

It has been found through experience that the most profitable way to educate the men is to first bring out the points in question in the shop while the men are at work upon the machines and then call a lecture and satisfy the curiosity aroused through failure to understand the thing while the machine was directly before their eyes. This method is being followed in the schools and is productive of results.

Ignition is the most difficult of all subjects to teach. It is a theoretical subject and is hard to explain in non-technical language. The men, of course, acquire a technical vocabulary as they proceed with the work, but it is a waste of time to make an expert electrical man out of a general mechanic. Ignition systems are the development of electrical engineers, and it is hardly to be expected that the laymen trained as a motor mechanic should be entirely conversant with the subject in all its lines.

Electrical work always must start at the beginning. First the most elementary principles are taught and then the applications of the principles to the machines. These are the methods followed at the Fort Sheridan school and the others.

It is expected that the men at Fort Sheridan will be able quickly to analyze a car's difficulties. With about twenty-five machines a month to study, and each one perhaps having a dozen different major and minor ailments, it is hoped by W. A. Richards, who is supervising the work in the shops, that men can be turned out within the average time of a month or five weeks, men who will be superior in knowledge to the mechanic who has collected his knowledge from garage work throughout a period of years.

How France Is Doing It

By W. F. Bradley

Motor Age European Correspondent

LYING between the world-famed Napoleon's tomb and the official residence of the president of the French Republic, with the ultra-fashionable Avenue des Champs-Elysees as its main artery of approach, stands the Grand Palais, indissolubly associated with French motor shows. When the French car manufacturers set out to convert the world—and France—to motordom, the only building which harmonized with their ideas of greatness was the biggest and most handsome, not only in Paris, but in any other city. They used big show

methods. With a floor space of 260,000 sq. ft. they could stage 1000 cars. For illuminations alone they spent $500 an hour on electric current. They were not afraid to lay out nearly $500,000 in the staging of the show, but it came back in the shape of $100,000 cash profit from the 550,000 visitors who paid for admission. How much profit there was from those who came as idle visitors and went away as enthusiastic motorists statistics cannot say.

Like everything else the Grand Palais has changed much since those days. As the ground floor is big enough to stage a motor race, they naturally turned it into a huge army garage in those tragic days of August and September, 1914. Parisians used to stand around the doors and watch the departure of officers on touring cars or sailor crews aboard gray armored cars; they got excited as dust-covered and bullet-pitted cars returned from the east, dashed past the sentries and disappeared into that huge building; they saw the departure of several hundred touring cars—they were not all taxicabs—carrying reserve troops from Paris to the Marne to save the capital from an invasion by von Kluck, and not many of them realized how motors were saving their city.

Since then the Grand Palais has always been more or less connected with motors. It is an ideal building in which to unite a few hundred cars, equip them, examine them, test them and then send them off to their particular portion of the front. At the same time it has never become a permanent depot, probably on account of its location being distant from the factories and centers of industry.

The Grand Palais' most important and most consistent work has been in connection with the restoring of wounded soldiers to full physical ability. Several of the big galleries have been converted into hospital wards, while under the huge glass-domed roof specialists are working by scientific exercises to restore partially crippled men to a full or approximately full physical development. When they come out of the hospital with their full complement of limbs, many of the men are not 100 per cent efficient on account of some local stiffness or malformation. The exercises, carried out under the supervision of doctors and experts in physical development, in some cases makes them fit once more for active war service and in other cases makes it possible for them to return to civil life with no important handicap.

Union of Foreign Residents

Another section of the Grand Palais handles men who have been so broken in the war that it is impossible for them to continue to earn a living at their own trade or profession. This section of the palace is not directly connected with the army, but has been established by a union of foreign residents in France who were anxious to show their gratitude to the country of their adoption by making it possible for her broken soldiers to start life afresh and with every prospect of success.

Thus at the present time the Union of Foreign Colonies in France has under its care in the Grand Palais about 400 maimed French soldiers who are being made into skilled craftsmen. The union receives its men when the doctors and nurses have finished with them. In a few cases, indeed, they come before they have been fully discharged from medical attendance, as I discovered in the School for Draughtsmen Dr. Vallée, who is in charge of the Grand Palais school, took me to a drawing table around which were seated six young men, five of whom had crippled hands and arms and were obliged to wear instruments and carry out physical exercises to regain the full use of their organs.

The metal working students just above are maimed French soldiers. Above them is a mechanics' shop in the Grand Palais school for maimed soldiers

The doctor responsible for the selection of the training has to take into consideration not only the present physical condition of the man but the condition he is likely to attain under treatment, his past education and training, his natural abilities and his preferences. The school aims at producing highly skilled craftsmen, who on leaving can take their place alongside more favored workers and immediately earn the full wages current in that profession. To attain this it is necessary to start out right, giving to the man the particular instruction suited to his case.

For instance, most members of the farming class who have become incapable of doing general work on a farm can be trained into first-class saddlers and shoemakers. This is a general rule, but now and again it is found that some young man, in early life, has been thrust into a trade for which he had no love and no special ability. After being broken in the war, these men have been able to select the trade which appealed to them most strongly, receive a thorough training in that trade and finally go forth to work under more congenial conditions and at better pay than they received for their work before the war.

Mechanics and general engineering are prominent at this school for maimed soldiers. After all brains are more important than limbs, as I soon was convinced after a detailed inspection of the school.

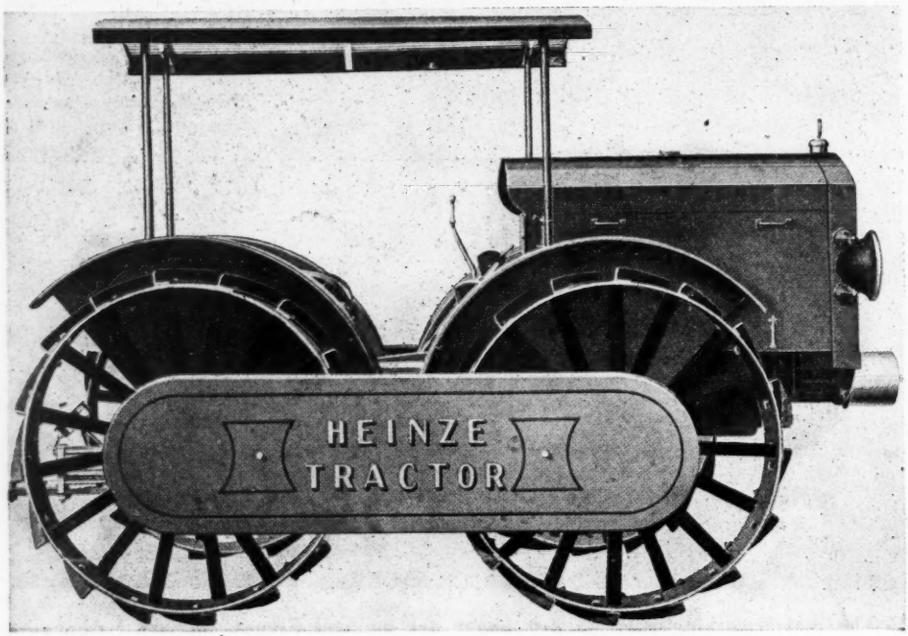
Fourth Annual National Tractor Show On

Double Header Opens at Kansas City with Farm Motors and Passenger Cars Centers of Attraction for Dealers Throughout Midwestern Territory

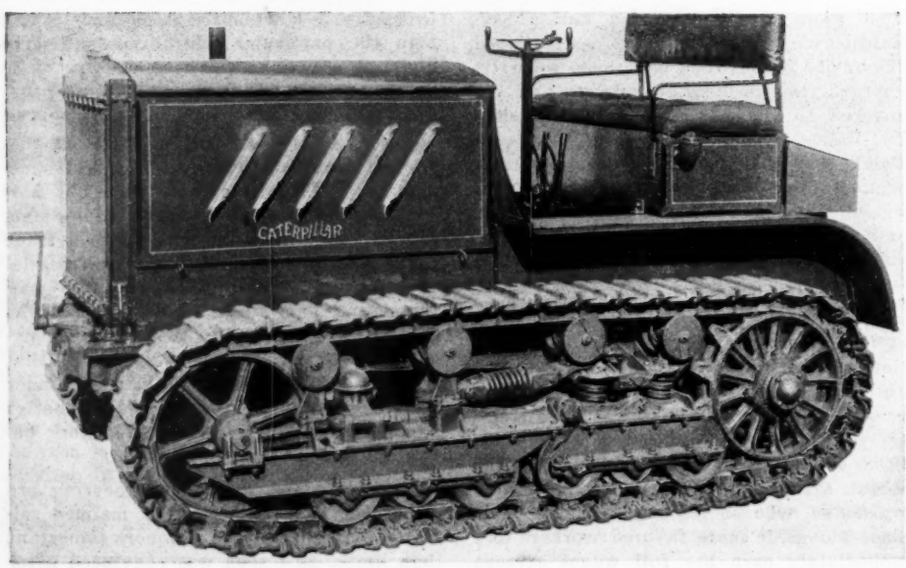
KANSAS CITY, Mo., Feb. 24—Special telegram—Automotive exhibitions in the mid-western territory opened in Kansas City to-day with a double header, the finest tractor and power farming equipment display ever staged in one building and an exceptionally creditable passenger car and truck show in another. Both shows are evidence of the progressiveness of their sponsors, the Kansas City Tractor Club, the Kansas City Motor Car Dealers' Association.

In a mammoth hall erected specially for the tractor show within a period of three weeks at a cost of $40,000, the fourth annual national exhibition of farm tractors presents the first opportunity of the season to study the advance of the last year in motor-driven farm apparatus and equipment. The tractor industry is represented almost wholly. The exhibits include almost every manufacturer in production. There are fifty-five makes of tractors, three of motor cultivators and three tractor attachments, mostly for Fords. One of the features of the show is the number of makers of first-grade parts and equipment makers represented.

A complete report of the Fourth Annual Tractor Show is assured for MOTOR AGE readers by the presence of staff members in Kansas City this week. Among those representing MOTOR AGE at the tractor show are David Beecroft, directing editor of the Class Journal Co.; Darwin S. Hatch, managing editor of MOTOR AGE; B. M. Ikert and Fred M. Loomis, both of the MOTOR AGE editorial staff. Beginning with the telegraph dispatches in this issue they will cover all the activities of the week in connection with the exhibition and dealer meetings.



A new farm tractor at the show, the Heinze



The Holt 5-ton farm tractor

Of the many exhibits of such things as carbureters, magnetos, bearings, batteries, steel forgings and stampings, everyone is among the leaders in his particular field. With the influence of these manufacturers, the status of the tractor as an article of commerce is fixed.

There are nine new tractors on display. The tractor show is staged under the management of Guy H. Hall, and the passenger car and truck show is managed by E. E. Peake. The latter exhibition, with a showing of all the cars and trucks represented in this territory, is housed in Convention Hall, a building which, until last Friday morning, was used as a community hall. Between that time and the opening of the doors at noon to-day the dealers had erected two balconies, which run entirely around the hall and on which are cars and trucks in addition to those on the floor, and had decorated the hall in a light blue and cream effect, somewhat reminiscent of the Madison Square Garden a few weeks ago.

One Really New Car

There is only one really new car at the show. This is the Highlander, a local production, assembled at the old Stafford plant and financed by local capital. It has standard units all the way through, including a Continental six engine, Delco ignition, Rayfield carbureter, Borg & Beck clutch, Timken rear axle and Stewart vacuum feed. The Midwest Motor Co. is the name of the builder.

The attendance at the tractor show today was large and interested. Dealers from the midwestern territory are coming in large numbers, and the representation from the farms will be larger even if not from as extensive a territory. Manufacturers are optimistic over the business prospects and expect to write business in excess of any ever before written at a tractor show or similar exhibition of automotive equipment.

A study of the tractors at Kansas City shows that there are certain features of construction and design which are becoming more general throughout the industry this year. Tractors are in process of development, and it will be years before anything approaching a final type can be arrived at. Nevertheless such features as the use of four wheels with the drive on the rear two, the four-cylinder vertical engine longitudinally placed and complete

inclosure of all mechanisms, permitting them to run in oil and be protected from dust, are present among the models exhibited not only in greater numbers than before but on the product of firms whose designs mark them as progressive and employing real engineering in their designs. These features are not always to be seen among all the products of the old and more conservative manufacturers with whom radical changes from previous practice would entail large outlays in new equipment. Among the new designs there is a marked tendency toward the adoption of the frameless type, pioneered by the Wallis.

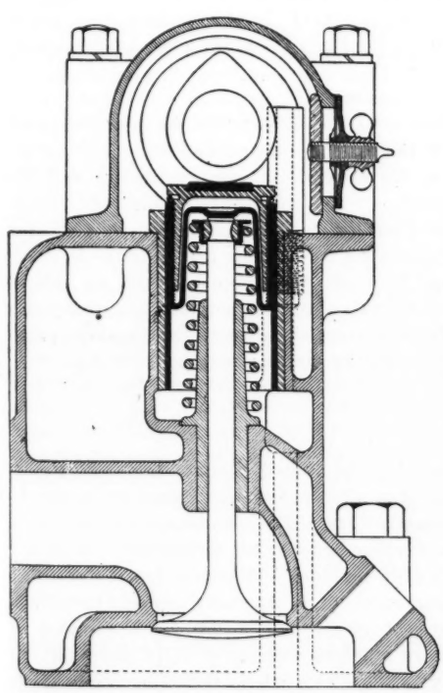
A census of the tractor show based on the number of models exhibited shows the following:

Rating Horsepower	No. models
5-10 to 6-12	3
8-16 to 10-20	11
12-20 to 12-25	24
15-30	23
18-36 to 20-40	12
25-50 to 30-60	5
40-80	2
55	1
125	1
No. Plows	
One	3
Two to three	11
Three	24
Three to four	23
Four	12
Six	5
Over six	4
No. Wheels	
Two	3
Three	4
Four	62
Five	1
Crawler	10
Drum	1
Drives On	
One wheel	2
Two wheels	66
Three wheels	1
Four wheels	2
Crawlers	8
Drum	1
Two front wheels	1
Cylinders	
2 cyl. horizontal	12
2 cyl. opposed	3
4 cyl. horizontal	5
4 cyl. vertical	61

New Tractors at Kansas City

KANSAS CITY, Mo., Feb. 24—Special telegram—The exhibit of tractors is not overcrowded with new models or new makes, which suggests that wildcatting is not on hand and new jobs are sane productions and in most cases have been well worked out and are not radical types, even if some of them employ some new ideas. They all give good indication of improved design in that they use completely inclosed transmission systems, keeping the dirt out of all parts as well as in a motor truck, and they have all substantially the same standard four-cylinder vertical engines that are in the modern truck. The freak has very little space in the show, although there are one or two that border closely on it.

The healthiest phase of this tractor show is the excellent exhibit of high-class parts, such as engines, bearings, ignition apparatus, castings, stampings, carburetion devices, radiators, etc. It is impossible with such improvements as have been made in the last two years in the more general use of such parts, to have anything but a most substantial improvement in tractors. The new tractors give adequate evidence of this general entry of those strongly entrenched parts makers who have played such a major part in building up the motor car and motor truck industry.



Cylinder head and camshaft housing on Walker engine

Heinze Four-Wheeler

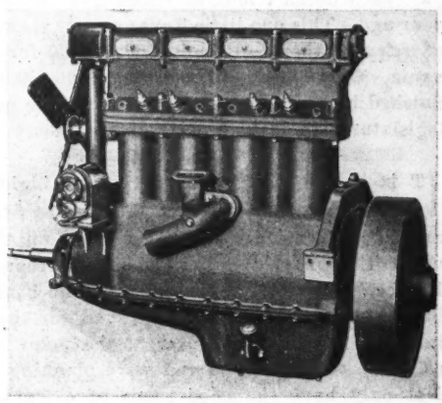
An entirely new thought in farm tractors is the Heinze four-wheel-drive, in which the two wheels on the right as well as the two wheels on the left drive as a single unit by inclosed chains. The tractor is steered by de-clutching either the two wheels on the right when turning to the right or the two on the left when turning to the left, the steering being the same as with a creeper type. The drive wheels are 42 in. in diameter, and the wheelbase is 56 in. The system of drive is very simple, there being a three-speed gearset formed as a unit with the engine and in rear of gearset is a worm reduction to a crossshaft carrying the differential. This crossshaft is midway of the axles and carries at each end a sprocket which drives through a chain to the front and rear wheel. The chain is outside of the wheels and entirely inclosed. The wheels are not carried on cross axles but in an H-shaped yoke supported at its center by the housing of the crossshaft. The yokes pivot on this housing and give great flexibility that permits the wheels to pass over obstacles without transmitting strain to the tractor.

The Heinze is the design of John O. Heinze, who has been connected with the automotive industry since its inception. The engine used is the design of Mr. Heinze and is a four-cylinder, L-head, block-type, with cylinders 4¼ by 6 in. Everything is inclosed in the design. The drivewheels are carried on Hyatt bearings, there being a bearing at each side of each wheel.

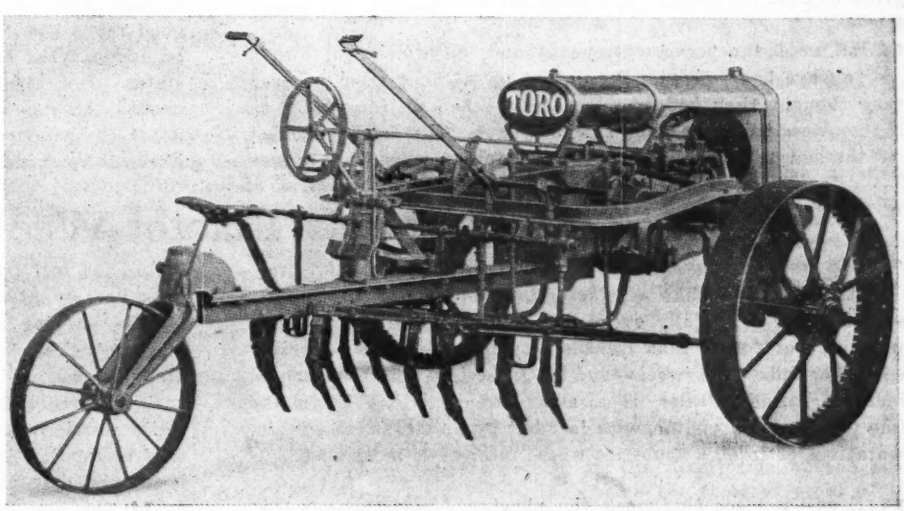
Automotive Rein Drive

An unusual tractor type is the Automotive tractor, which is driven by leather reins the same as a horse. To turn to the right one rein is pulled. To turn left the other one is pulled. Pulling both reins disengages the clutch. Another rein operates the gearset. As the engine is fitted with a governor there is no throttle or spark control. The Automotive tractor is a four-

(*Continued on page* 19)



Another view of the Walker engine



The Toro motor cultivator shown at Kansas City

EDITORIAL

What Do You Think of This?

WE repeat it verbatim, for fear you may have overlooked it in reading through this week's issue and thereby missed something well worth reading:

> "Austin, Tex., Feb. 22—Rockwall, the smallest county in Texas, received in recognition for its work for good roads a high honor from the Texas legislature. This county recently voted a bond issue of $800,000, thereby obligating an average of $800 a voter to complete a hard-surfaced highway from county line to county line and further extend a system of roads within the county."

THERE is a little more to the news item, as to the action taken by the Texas house of representatives, but let this suffice for our theme. What do you think of it? For it must make every person who is at all concerned with good roads sit up and think.

THE millennium in good roads is a long way off yet, but the path doesn't look so rough and darksome as it did, say, a year ago. This one little Texas county makes it brighter. Think of a few of them? Illinois, $60,000,000 for good roads; Pennsylvania, $50,000,000; Minnesota, $100,000,000—the list is not finished by any means. Other states are considering it in their legislatures to-day.

IT is as the great transcontinental highway association said in its resolutions when it gathered at St. Joseph for its sixth annual convention: We must back up the boys Over There when they say, "Believe me, we recommend the roads of France." And when these boys come back—and as they come back—we must work hand in hand for the same kind of roads in the United States. Here's the point right here. It looks as if we were doing it and were planning to keep on doing it. Not only have the good roads of older Europe waked us up, through the boys Over There, but the roads of our own country, good only in spots and those woefully isolated sometimes, have given us food for thought and cause for action.

THE need for permanent, year-round, city-to-city highways always has existed. People put up without them because they thought they had to. Farmers stocked up for winter as if they were back in the old stockade days. City folks depended on the old reliable tin can for vegetables when the farmer couldn't haul his to town or afford to raise them even on account of poor roads. People put up without permanent, year-round roads because they thought they had to. But they don't think so any longer. They see the need and they see the future, wherein the vision of year-round roads is materialized. Need for greater food production, need for greater transportation facilities—which means the use of the motor truck to its full abilities—need of closer bonds of communication, if you please, whether for transporting food, merchandise or troops, has aroused the whole nation to the fact that not only do we need good roads but we can have them if we want them hard enough.

ELSEWHERE in this issue you read that four of the states on one of our national highways are considering $115,000,000 worth of bonds and a state fund of $2,000,000 a year for ten years to build state systems of permanent roads. Meanwhile Congress is considering a possible $200,000,000 for good roads. This is as it should be. It shows that our nation has not gone through the stress of wartimes to no avail.

WHAT does this mean to the dealer? It means a great deal to the dealer. In fact, it is a question as to whether or not any one line of business or any one factor in the nation's life will be affected more directly. The national organization of dealers recognizes the value of permanent highways to the dealer. It expressed this recognition in its annual meeting this year, at which it drew up formal resolutions endorsing the development of both highways and highway traffic and the establishing of a national highways system with a Federal highway committee. Good roads and transportation are linked together. Without the one, where is the other? In this modern time, transportation means motor vehicles. Without good roads, where are your motors?

IT is of first importance to the dealer that he give the good roads movement of the various states and communities to-day all the support at his control. It was the dealer and the various dealer organizations who helped put Illinois' $60,000,000 good roads bond issue over the top. What has been done can be done. What has been done for Illinois can be done in other states. But remember it needs your support, just as Illinois needed the support of Illinois dealers, just as any community needs the support of its dealers, in every other activity that works toward its upbuilding as well as in road-building.

This Is Tractor Week

THIS week we have with us, gathered at Kansas City, practically every make of tractor in production to-day, representatives of practically every line of automotive interest—for we must not forget that Kansas City is holding its passenger car show also this week—and a gathering whose personnel includes farmer, dealer, repairman, car owner, on down the line to the casual visitor, with last but by no means least representatives of foreign countries whose interest is most keen.

WE will not see this week the plowing demonstrations that makes such as Salina last summer of so much value. It is an indoor at-home. The tractor is not out in the back lot tearing up the turf but meeting the crowd under a roof. It is perhaps unfortunate that not all tractor shows can be made to include plowing demonstrations. But Kansas City serves a purpose that needs no further accessories to interest. It is the first post-war exhibition of tractors. It is the first attempt to gather together the survivors of a war-time period, in which, while restrictions were of effect only briefly, the demand of food production for more tractors was never fully supplied. It is the first opportunity to view as a whole the refinements made during this war period. Refinements that make tractor design a more simple proposition for the farmer to operate and a more simple proposition for the dealer to sell and render service on.

Activities That Bring Better Highways Near

Four Southern States Consider Good Roads Funds

CHATTANOOGA, Tenn., Feb. 22—Bonds in the sum of $115,000,000 and a state fund of $2,000,000 per annum for a period of ten years represents the plans of the four Dixie Highway states of Tennessee, Georgia, North and South Carolina to build state systems of permanent roads. The legislatures of Tennessee, North and South Carolina are now in session, giving what is believed to be favorable consideration to the respective measures. The legislature of Georgia will meet in June. However, a strong movement is on foot in that state to have a special session of the legislature in March to authorize the bond issue and keep pace with the other states by preparing to start work with the increased funds this year. The directors of the Dixie Highway Association are leading the fight in each state for the bond issues. It is felt this is the quickest way to secure the permanent improvement of the highway.

$50,000,000 for Tennessee

Tennessee is leading off with a proposed bond issue of $50,000,000, which will be taken care of by an increase in the motor vehicle tax to $1 a horsepower and the use of the mill tax, which now is being collected for state aid. As it is not necessary for this bond issue to be referred to a vote of the people, it is possible Tennessee will get the measure through in advance of her sister states. The legislation designates the general routing of the highways to be permanently improved. A state hig way commission comp sed of three members devoting their entire time to the work, the governor and the state treasurer is proposed.

Georgia is clamoring for a bond issue of $40,000,000 built along the lines of the Illinois plan and provides for a state highway commission of three. The motor tax is increased to an average of $20 for passenger cars and $40 for trucks. Three classes of state roads are provided for, the only limitation being that at least 70 per cent of the funds must be expended on an approved type of paving.

South Carolina is asking for $25,000,000 in bonds to be retired and interest paid out of the license fees. The tax is placed at $1 a horsepower. A new highway commission also is being asked for.

North Carolina has substituted for the bond issue plan the raising of a fund of not less than $2,000,000 annually for a period of ten years to meet any Federal aid secured. This fund will be raised by an increase to 75 cents a horsepower for motor vehicles and other taxes. A new highway department also is being sought. North Carolina's appropriation will be available as soon as the bill passes.

NATIONAL COMMISSION ENDORSED

St. Joseph, Mo., Feb. 21—C. F. Adams of Chillicothe was re-elected president of the Pike's Peak Ocean-to-Ocean Highway Association and a Federal highway commission was endorsed at the sixth annual meeting here Feb. 11-12. The other officers are: Vice-president western division, W. H. Goodin, Lovelock, Nev.; vice-president eastern division, Warren R. Jackson, Harrisburg, Pa.; vice-president central division, George W. Hughes, Hume, Ill.; secretary, T. W. Ross, Colorado Springs, and treasurer, A. Q. Miller, Belleville, Kan.

The association authorized its enrollment as a member of the Associated Highways of America and voted to adopt the official organ of the Jefferson Highway Association as its official organ in the absence of any other.

Resolutions were adopted endorsing the action of Illinois in its $60,000,000 bond issue and recommending similar action in every state through which the highway passes. The increase in license fees to obtain more money for roads also was endorsed, and the association pledged its assistance to the passage of the $200,000,000 road aid rider of the Postoffice Bill.

Acting Secretary J. W. Deane spoke during the convention in commemoration of the work and life of A. W. Henderson, secretary-treasurer, who died Dec. 18, touching on the high respect and deep regard with which he was held, the untiring devotion to his self-appointed task.

The seventh annual convention will be held at St. Joseph next year also.

WELL WORTH CONGRATULATIONS

Austin, Tex., Feb. 22—Rockwall, the smallest county in Texas, received in recognition for its work for good roads a high honor from the Texas legislature. This county recently voted a bond issue of $800,000, thereby obligating an average of $800 a voter to complete a hard-surfaced highway from county line to county line and further extend a system of roads within the county.

This was called to the attention of the house of representatives of the Texas legislature, which, in a resolution, extended to the citizens of Rockwall county its felicitations and congratulations and commends its example to other counties.

To Make All Sizes of Tires

NEW YORK, Feb. 21—The limits set on the manufacture of tires by the War Industries Board during the war will not be followed in the future, and all sizes of tires demanded by the public will be manufactured, according to an announcement by the National Automobile Chamber of Commerce.

This decision followed a meeting of tire and car makers here late last week. The restrictions placed on tire manufacture by the War Industries Board in an effort to conserve rubber, labor and factory facilities in the spring of 1918 called for a reduction of pneumatic tires from a range of 200 sizes and types to nine sizes and types, the reduction to be made over a period of two years. Truck tires were reduced by a similar order from over 100 types and sizes to fourteen, affecting chiefly those tires used on 1- and 2-ton trucks.

National Committee Is Organized to Help Work

WASHINGTON, Feb. 21—As a result of the meeting of various organizations interested in highway construction in Chicago, the National Highway Committee is being organized to represent practically every organization for the construction of roads and those interested in the work, and to secure intensive individual support for road construction.

S. M. Williams, president of the Highways Industries Association, has appointed the state highway commissioners and engineers and various prominent men throughout the country to the committee, giving each state representation of three or more and in each case selecting men known for their present interest and activity in highway development. Total membership of the committee will be about 300 and will include the presidents of various prominent national organizations, such as the American Road Builders' Association, National Automobile Dealers' Association, etc.

It is planned to form smaller committees for the more concentrated work, and these special committees will be charged with lining up the organizations of their individual groups.

Following is a chart of the Federal Highway Committee. Although the organization is not yet completed, it is already assuming important proportions:

FEDERAL HIGHWAY COMMITTEE

W. T. White, Cleveland, Ohio.
F. A. Seiberling, Akron, Ohio.
R. D. Chapin, Detroit.
A. G. Batchelder, Washington, D. C.
Coleman Dupont, Wilmington, Del.
F. W. A. Vesper, St. Louis, Mo.
A. H. Blanchard, New York.
Charles H. Davis, Cambridge, Mass.
Alfred Reeves, New York.

NATIONAL ROAD ORGANIZATIONS

Highway Industries Association, Washington, D. C.
National Highway Association, Washington, D. C.
American Road Builders' Association, New York.

TRANSCONTINENTAL ROAD ORGANIZATIONS

Lincoln Highway Association, Detroit.
Dixie Highway Association, Chattanooga, Tenn.
Jefferson Highway Association, St. Joseph, Mo.
National Old Trails Association, Kansas City, Mo.
Pacific States Defense League, Seattle, Wash.

STATE GOOD ROAD ORGANIZATIONS

Ohio Good Road Federation, Columbus, Ohio.
Michigan Good Road Federation, Hastings, Mich.
New York State Road Builders' Association, Albany, N. Y.

In addition various trade bodies, commercial clubs, rotary clubs, protective associations, etc., are included.

PANHARD CLOSED CAB

Chicago, Feb. 24—The closed cab shown on the new Panhard at the Chicago truck show does not come as standard equipment, although this information was included incorrectly in the description of the issue Feb. 13. As in the cases of other of the truck concerns, the closed cab is extra.

Louisville Sells All Its Show Cars

Business Is So Good Displays Are Spoken for by Wednesday

LOUISVILLE, Ky., Feb. 22—Shattering all previous attendance records and marked by an unprecedented number of sales, the eleventh annual exhibition of the Louisville Automobile Dealers' Association closed to-night, bringing to an end the most successful show ever held south of the Ohio river. It opened at 6 p. m. Monday. By Wednesday evening the majority of the exhibitors had reported the sale of all the cars in their booths. Several dealers asserted that all their reserve stock in warehouses had been signed for, and at the close of the show practically all the new models had been sold. All exhibitors expressed themselves as pleased with the results of the exhibition. It is impossible to state accurately the number of machines sold, owing to the tendency of some of the dealers to keep their sales secret. Fifty-five exhibitors were represented. Each dealer showed from one to eight models, aggregating about 140 cars.

Louisville District

The district embraced by the Louisville distributers and factory representatives, as a rule, covers southern Indiana and the western half of Kentucky. In some instances the distributers have the entire state. Hundreds of dealers from not only this territory, but Tennessee as well, visited the Armory and all of the hotels were filled. Many new contracts were made, and a great deal of new territory was opened up. Men who had visited other shows this season declared the Louisville show the best business exhibition they had attended.

The attendance on Wednesday alone exceeded the attendance of the entire week of any former exposition, it being practically impossible for the ticket sellers to sell tickets fast enough, and the entrance to the Armory became so blocked by those who wanted to get in that it became necessary to call in additional help to handle the crowd. Additional ticket offices were established Thursday night, and the attendance equaled the previous night but was handled with less congestion. The attendance figures for the week were placed at 60,000 by the management.

An orchestra furnished music every afternoon and night. Although the dealers spent some $8,000 in lighting effects and decorations, and the interior of the big military building was turned into a thing of beauty, the impression went out from the start that it was to be a practical business show, and it was, in every sense of the word.

The most expensive car in the Louisville show was a six-passenger Pierce-Arrow open touring car, whose value is $6,500 net, exclusive of 3 per cent war tax, freight and war tax on freight. The car is the property of Hite D. Bowman and is a personal triumph for him. Several years ago Mr. Bowman tried to get Pierce-Arrow to build such a six-passenger touring car along lines he suggested. He insisted and finally after he had paid a $500 bonus the car was built with an aluminum body, and Mr. Bowman drove it home to Louisville.

Several duplicates of the model were shown at New York and in other cities, and now the company is manufacturing it. It is rated at 48 hp. and its speed is estimated at 78 m.p.h.

Kentucky is credited with twenty-one exclusive supply houses, 314 dealers, 244 garages and eighty-three repairshops. Louisville is not a motor car city in the producing sense, but from a standpoint of distribution and use it ranks with the leaders. Some of the largest factories and tire concerns in the country maintain branches here. Louisville products at the show were represented by the Dixie Flyer passenger car and Old Hickory truck, made by the Kentucky Wagon Mfg. Co.

The year 1919 brought many changes in the industry in this vicinity. There are several makes of cars sold here now that were not represented last year. Many new firms came into existence and reorganizations took place only a week previous to the show. The new companies, as well as the old, are reporting good business and prosperity.

In Louisville seventy-seven different makes of passenger and commercial cars are handled by fifty-four dealers and distributers, and practically all these were to be found at the exposition. The feature of the display was the intense business character of the inspection of trucks and tractors which culminated in many sales. Competent judges of industrial shows state that so much attention has never been given the details of any local exhibition as was accorded the displays of these vehicles. It is pointed out that since America joined the Allies the farmers have come to look upon the motor vehicle and tractor as the means of introducing modern efficiency and comfort into their life and work.

All the exhibits at this year's display were arranged on the first floor of the First Regiment Armory with 54,000 sq. ft. of floor space.

Business is far better than it was this time last year. An estimate based on interviews with the distributers point to an increase of 80 per cent in the sales during the first eight weeks of 1919 over the same period in 1918. The only thing worrying the dealers now is the question of whether they will be able to get all the cars they will need from their factories. If they do, more machines will be sold in this state than ever before.

Boston's Open House

BOSTON, Mass., Feb. 22—Hundreds of motor cars and several trucks were sold here to-day during the annual Open House feature which marks the opening of the spring season of selling in this city. It was the first time any of the truck companies were open, and a few of the firms that have been closed in the past joined in keeping open so that there were practically no closed salesrooms in the city. All the used car dealers were open, too, and some of the tire companies. Several thousand persons made the rounds this year, far more than ever before, showing the great interest in motoring now.

It was an ideal day for the opening with warm weather. As the motor district is laid out on practically a straight line it was easy for visitors to start at either end and make a tour of the district. Some of the dealers featured the day in different ways. At the big Packard plant there was the

General view of Louisville show. Trucks are shown under the balconies

Liberty aviation engine on a Packard truck. A collection of war souvenirs, brought across by Congressman Alvan T. Fuller, the Packard distributer, on his recent trip to the war zone, was shown also.

In the Dodge Brothers' place there were an orchestra and moving pictures every hour. The Henley-Kimball Co. featured the Essex and the Hudson. On each half-hour demonstration trip the Essex carried a full load. The Cadillac decorated with a bust of Washington and a lot of flags and bunting. Frank E. Wing had a lot of visitors at the Marmon, the cars being surrounded by some tropical plants. Flowers predominated, too, in the Chalmers-Maxwell salesrooms, and the Oakland and Cole dealers spent some money preparing to give their cars a good setting.

The Mack truck salesrooms had motion pictures also. The Denby was opened for the first time by a new company that took it on a few days ago, and they made two sales. The motorcycle dealers did a good business, and the used car men said it was one of the best days they ever had.

COLUMBUS HONORS RICK

Columbus, Ohio, Feb. 21—The welcome to Capt. Eddie V. Rickenbacher participated in by the entire populace of Columbus, his native city, was tendered formally Feb. 17. Captain Rickenbacher arrived in the city on an early train and was met at the station by a reception committee representing the state government, the city government and the chamber of commerce.

One of the features of the day's celebration was the parade through the principal streets of the city which took place in the afternoon. In the evening the Columbus Automobile Club gave a big banquet to Rick, which was attended by about 500.

Gen. William L. Kenley, chief of the aviation service at Washington, attempted to fly to Columbus to attend the banquet but a severe snowstorm compelled him to alight at Alliance. Later the airplane was started and he and his pilot landed upside down near Denison, Ohio, little the worse for wear, but General Kenly came the rest of the way on the train.

St. Louis Show Draws Record Crowd

Attendance 35 Per Cent Over Past Years—Mostly Prospects

ST. LOUIS, Mo., Feb. 22—The twelfth annual show, which closed with a dance in the corridors at midnight, was entirely the most successful enterprise of this sort undertaken in St. Louis. The attendance went very close to 100,000 persons, an inerease of 35 per cent over any previous year. The first night the count reached 24,000 and would have been more except the fire department caused the closing of the gates at times.

The show was given under great disadvantages. The opportunities were better than last year, because it was given in the same building—the former Southern Hotel —and some alterations had been made to aid the cause. But still much is needed to make this into a desirable building. The automotive equipment section had two long corridors on the second floor, in which the front partitions of the former hotel guest rooms had been removed, making the two corridors a long series of room-sized booths. Concrete floors had been put in and these well-lighted exhibits made a handsome showing.

No trucks were shown for lack of room, but the twenty-four truck-selling firms were given desk room in two large rooms, where they had space to show parts and distribute literature. The truck men did not much like this at the start, but they found that a surprising number of prospective truck buyers came to the show to look over the motor cars and then dropped around to talk to the truck men.

Just how much business was done at the show is, of course, a question that cannot be answered now. The Moon Motor Co., for instance, closed a deal with a dealer in Illinois for 100 cars. This man had lost his chief line during the war and waited until he came to the show to make his decision as to what line he would handle this year. This is believed to be the largest deal closed. But there were a good many new dealer contracts written. This was especially so as regards the new, or comparatively new, cars that sell in the neighborhood of $1,200. It appears several dealers let go of their low-priced line during the war and were in the market for the car that made the best impression on them at the show.

St. Louis is the home of the Moon Motor Car Co. and therefore it was fitting that this company should make the first showing of its new Victory model here. This is a slightly smaller six than the previous Moon and is distinctive chiefly by a radiator that closely resembles that of a Rolls-Royce. The car is to sell for $1,685, and dealers can give purchasers any color option they want without extra cost. The wheelbase is 118 in., the engine is a six-cylinder 3¼ by 4½ Continental and tires are 32 by 4. The gearset is a unit with the engine.

The territory covered by St. Louis dealers is a large one. There were dealers at the show from Tennessee, Arkansas, Kentucky, Illinoisi, Mississippi, Louisiana, Texas and Florida. But as a rule St. Louis distributers cover only parts of Missouri, Illinois, Kentucky, Tennessee and Arkansas.

During show week there were several dealer gatherings. Tuesday, Ed Peake addressed a gathering of nearly 500 dealers. Wednesday F. W. A. Vesper, Bob Lee and John Shuford addressed about 300 automotive equipment men. These were the principal meetings; then there were gatherings of a number of distributers and dealers.

As a result of the show, and because of the success with a similar venture last year, the St. Louis Automobile Dealers' Association has decided to hold a used car show in the Exhibit building March 10-15. The committee to supervise the show includes Edward Weber, president of the Weber Motor Car Co., Studebaker; R. C. Frampton, president of the Hudson-Frampton Co., Hudson and Essex; and H. R. Henry, manager of the Overland Automobile Co.

The committee which had the passenger car show under its wing consists of: Chairmna, H. F. Fahrengrog, Kardell Motor Car Co.; Phil H. Brockman, De Luxe Automobile Co.; W. J. Johnson, Johnson Automobile Co.; Joseph A. Schlecht, Mound City Auto Co., president of the association; John F. Shuford, Shurnuff Mfg. Co.; and C. E. Lightfoot, General Motors Truck Co. Robert E. Lee is manager and has been in charge of St. Louis shows for the last twelve years.

Part of the accessory exhibit at eleventh annual Louisville show

COMET TRUCK 1½-TON

Decatur, Ill., Feb. 24—The Comet Automobile Co. has changed from a 1¼-ton to a 1½-ton truck and will market the new model at $1,750.

Iowa Is Ready for Big Motor Trade

Exhibition Dispels All Doubt as to Future in Hawkeye State

DES MOINES, Iowa, Feb. 22—Iowa is ready for a bigger and better motor car trade.

Had there been any doubt of the after-the-war status of the motor car and automotive equipment business in the Hawkeye state it was entirely dispelled by the show which closed to-night.

Enthusiasm and optimism were the keynotes.

As an Iowa institution the Des Moines show was noteworthy this year for several reasons. For one thing it is the first time one building has ever housed both the passenger car and the truck show. Also for the first time tractors and automotive farm equipment became a full-fledged feature of the show. By Wednesday evening all previous attendance records had been broken and more had seen the show than during the entire week a year ago. For the first time attendance topped the 50,000 mark.

The show was held in the new Ford building, two floors of the structure being used, which gave a floor space of 113,500 sq. ft., more than five times as much space as was ever used for any previous Des Moines show.

Management of Show

Dean Schooler, president, and C. G. Van Vliet, secretary of the Des Moines Dealers' Association, and Harter B. Hull, president of the Motor Truck Dealers' Association, were managers of the show, and the two associations worked hand in hand for its success.

At first members of the Des Moines dealers' Association were dubious about taking the show out of the business district, as the Ford building is located at the extreme end of motor row and fully a mile from the center of the city, but the first day's attendance of more than 6000 proved the location did not matter.

The building is almost ideal for a showroom. It is 453 ft. long and 125 ft. wide, has more windows than any building in Iowa and is thoroughly fire-proof. Each of the sixty-four exhibitors was allotted a floor space of 1250 sq. ft. and by use of the great community aisle, 21 ft. wide and running the full depth of the building, every exhibitor was given front space and none was hidden in a secluded corner.

The passenger cars were on the second floor and included forty-eight makes and 200 models. On the third floor was the tractor and truck show, where thirty-five makes of trucks and eighteen tractors were displayed. This floor also held a few lines of bodies, trailers and truck builders.

Trucks and tractors crowded out the accessories this year, and this feature of former shows was given over entirely to the Herring Motor Co., which held its second annual automotive equipment show in its service building. The entire second floor of the Herring building was used, and 100 separate exhibits, covering a floor space of 20,000 sq. ft., were on display. Something of the size and importance of the Herring show may be gained from the fact that 122 factory representatives were present during the entire week and more than 400 dealers were registered. C. L. Herring, head of the Herring Motor Co., in fostering the show, had an idea greater than simply increasing sales for his company. Mr. Herring believes that the personal touch between the factory expert and the small town dealer gained at his show is going to tend wonderfully to the advantage of the dealer.

It is Mr. Herring's idea that first-hand information given to the dealer by the factory expert is going to put that dealer in advance of the dealers of his home town who do not have the advantage of this service and for this reason the Herring company mailed invitations to 8000 dealers of the Central West, and the response was most hearty. Every day during the show the Herring company served free lunch to from 250 to 400 dealers.

As noted earlier, this year's Des Moines show was an optimistic one. Doubt and fear, which characterized the feelings of the Iowa dealer one year ago, have disappeared and in their places have come optimism and confidence.

Given promises of at least a fairly satisfactory delivery condition, the Iowa dealer is throwing himself into the game with the old time pep and has forgotten the drawbacks of the restricted conditions of the war years.

More than 1000 dealers, largely from Iowa, but some from Nebraska, and a few from southern Minnesota were in attendance, and they are almost a unit on this optimistic program.

There never was a time in the history of the state when a more prosperous condition prevailed or when people had more money to spend for motor cars.

Iowa is primarily and characteristically an agricultural state and is not affected by financial problems as readily as the sections of the country dependent upon industry. The state has never known a crop failure. Some sections of the state may suffer, but as a whole the Iowa soil turns out her riches year after year without ever a loss.

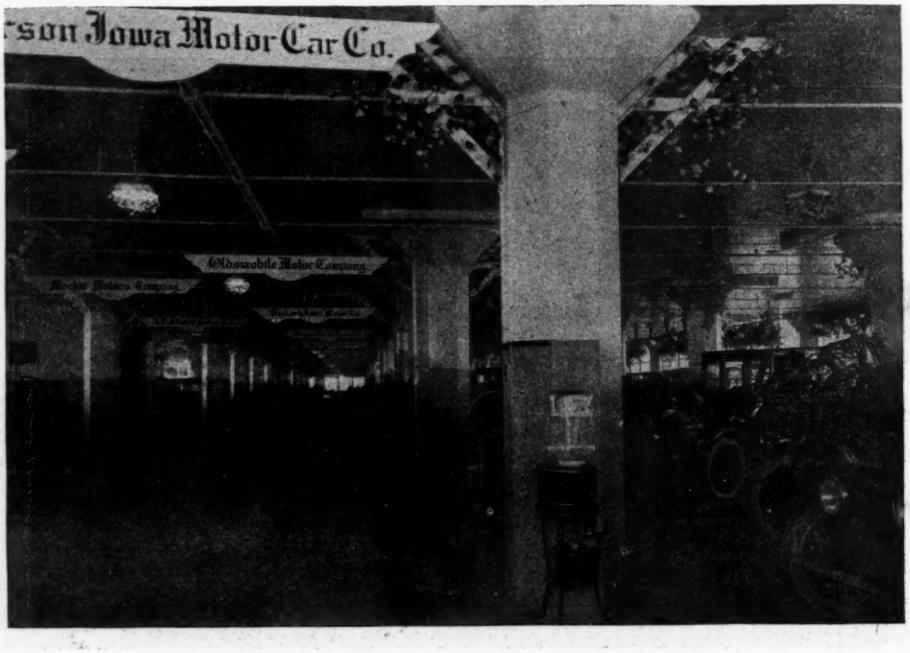
In 1918 the soil crops of the state were valued at $862,215,117. This is an increase over 1917 of $40,000,000 and is nearly double the value of the 1916 crops. Based on a price of $1.23 a bushel, the Iowa corn crop alone was last year valued at $438,712,710. The yield was 366,377,000 bu., and of this amount only 4 per cent was reported soft or immature by the Federal crop experts, whereas in 1917 a great deal of the crop was soft and did not bring good prices.

While Iowa's lead in agriculture is attributed to corn, the value of her oat crop in 1918 was $142,203,200, and barley brought to the Hawkeye farmers $9,407,788. Spring wheat netted another $21,000,000. Other little items of profit from the soil are $10,000,000 from potatoes and $8,000,000 from alfalfa.

The 199,755 farms in the state, counting their buildings and the farm machinery, are rated at $4,403,347,348.

So it may be seen that the Iowa farmer is some prospect when it comes to motor cars, tractors and trucks, as is further demonstrated by the fact that the state now has registered ?~7,500 cars and trucks, or one for every seven persons.

While the wealth figures are based on 1918 figures, there is every reason to believe that the 1919 productions will be even greater. An unusually mild winter has been most favorable to winter wheat, and even while the Des Moines show was in full sway a snow, which crop experts in Des --oines pronounced ideal for this crop, was falling. Then, too, a great increase in production may be expected from the decided



General view of Des Moines show of cars, trucks and tractors

increase of tractors noticeable and from the additional farm help available this year. Because she is a farmer state, Iowa's largest donation in men to the army came from the farms, and in 1918 the labor shortage created was at times critical. Employment departments predict that by the time spring work opens up on the farms there will be sufficient man power available to insure the placing of the greatest crops the state has ever known.

IOWA FORD MEN MEET

Des Moines, Iowa, Feb. 22—The usual number of outside features were present. The Ford Motor Co. gave what it calls a mechanical clinic on the fourth floor of its building. An amphitheater had been erected with a seating capacity of between 300 and 400. This surrounded a completely equipped automotive repair show, containing the overhead shafting and such equipment as an engine stand, rear axle stand, burn-in and work-out stand, arbor press, grinding and buffing stand, lathes, etc.

Ford dealers, of whom several hundred were attending the show, were invited to attend the clinic Wednesday afternoon, where the practical work of dismantling front and rear axle and engine, the burning-in of crankshaft and other repair operations were illustrated by regular mechanics and by the use of the equipment provided. The purpose was to give ocular demonstration of the time and labor saving qualities of proper repair shop equipment and to impress upon the dealers the importance of their equipping their shops with similar machinery.

The idea of these mechanical clinics was conceived by A. W. L. Gilpin, manager of the Milwaukee branch, and the lecturing was done by his assistant. A similar clinic was held during the show at St. Louis.

Thursday night at the Chamberlain Hotel the Ford Motor Co. entertained several hundred Iowa Ford dealers at a banquet.

Last night the Herring Motor Co. gave a banquet for the 112 accessory concerns who combined to put on the automotive equipment show in the Herring building, described elsewhere.

Baltimore Show Is Great Buying Affair

Motor Club and Dealers Make Thirteenth Annual Successful

BALTIMORE, Md., Feb. 22—The greatest purchasing show ever held in Baltimore closed to-night at the Fifth Regiment Armory after five days' run with thirty-six dealers showing more than 200 models of more than a score of manufacturers. This successful event was the thirteenth annual show held under the joint auspices of the Baltimore Automobile Dealers' Association and the Automobile Club of Maryland.

The decorations were highly artistic, with 600 lights in a low ceiling of sky blue, while the walls were covered with oriental effects. Lattice pillars around which entwined southern smilax were at the corner of the aisles, and a lattice effect over which appeared the name of the car shown was in the center of each booth. The booths were free from the overcrowding effect that has marred some of the Baltimore shows. Many of the spaces were larger because there were a half dozen less exhibits this year than last. Dealers also sacrificed the overcrowding because many of them were unable to obtain as many different makes of cars as they desired, but the show was a good one.

More bona fide orders were obtained and more real prospects secured than at any previous Baltimore show. People came to buy. The attendance was approximately 35,000, not quite as large as 1917 but larger than last year.

Closed cars, sedans and limousines had the biggest call from the buyers. Rural trade from various parts of the state were brought to the show by dealers in sedans, and these trips by the dealers helped in the selling. The sub-dealers benefited because they were thus able to sell their trade at the list price.

Ten chassis, three engines on stands and a Liberty engine were on exhibition.

Educational features abounded. The dealers' association and the motor vehicle commissioner's office had booths. At the latter, Roger S. Williams, chief inspector of the office, issued licenses and explained the law. The dealers established a question box to handle the problem of out-of-the-city dealers, while the club officials had a staff giving information on touring routes over the roads of Maryland. New members were added to the roll of the club, which is now over 4000, 1500 being recently added through the membership drive.

Baltimore and Maryland dealers still have a lucrative field for selling cars. Business and professional men, farmers and an especially high grade of investors are in this territory. New plants, employing many high grade men, with new factories constantly opening up in the enlarged city, which recently added more than 50 miles to its territory, also forecasts possibilities. The 1918 motor vehicle receipts are $815,385.15, and, for the fiscal year ending April 30, 1919, it is expected to exceed $1,600,000.

The show was arranged and handled by the following committee for the dealers: L. E. Lambert, J. J. Flynn, W. F. Kneip and A. H. Bishop; and for the club, W. S. McCurley, Thomas G. Young, John S. Bridges and H. M. Luzius, secretary and general manager.

The commercial car men held special exhibits in their show rooms and sales and prospects were obtained. Incidentally, many prospects that had been hanging fire for a long time were closed up. Thirty-three dealers held shows, showing thirty-nine makes of trucks, three distinct types of trailers and three tractors. Optimism is in the ranks of the commercial car men, who predict that this year is going to exceed any previous normal year's business.

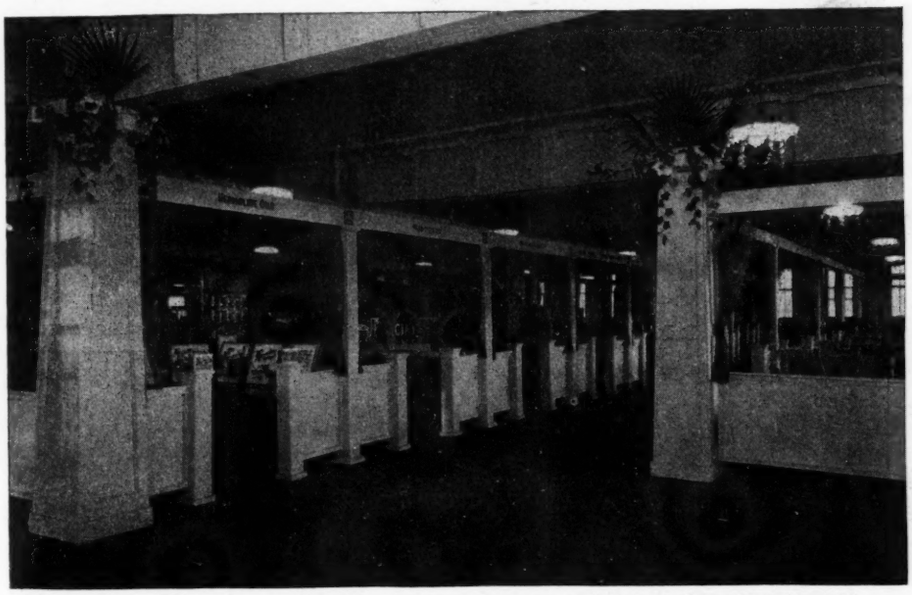
INDIANAPOLIS PLANS OPENING

Indianapolis, Ind., Feb. 22—The Indianapolis Automobile Trade Association has voted to hold an opening March 10-15. The association had under consideration a show at the Coliseum at the state fairgrounds and an opening week in which the dealers would show their goods in their own salesrooms. A vote was taken and more dealers wanted the opening week. Some few, however, announced that even with a show, they intended to hold a spring opening in their salesrooms.

The Indianapolis automotive opening will include displays of cars, motor trucks, farm tractors and accessories.

Next year a show building probably will be available, as a building primarily for automotive shows is to be built on the state fairgrounds.

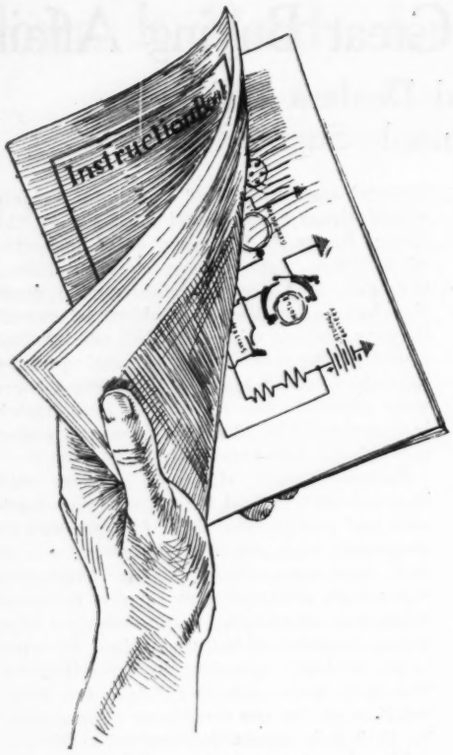
A. B. Wagner, manager of the Indianapolis branch of the Marmon Co. is the new president of the Indianapolis Automobile Trade Association, which has voted to broaden its influence by investigating the wisdom of taking in the dealers of the state. The other new officers are: N. H. Cartinhour, vice-president; J. C. Lathrop, treasurer, and A. M. Hutchinson, secretary.



More than 112 accessories were in the Herring show at Des Moines

"Garagemen Should Talk More," Says Bill Strong

And He Tells Why Here



"I am glad to admit that I can and do use a book when I can save time that way and thus cut down your repair bill"

"THE trouble with the average garageman or repairman," said Bill Strong, "is that he does not talk enough."

Bill runs an ideally successful business in Liveburg so what he has to say about it is worth listening to.

"Perhaps some customer, somewhere, sometime, has been driven away by the overgarrulity of a garage proprietor, but this is a mere drop in the bucket to the number that change allegiance because the owner of the business or his manager does not talk enough.

"What do I mean?

"Well, take that man who just drove out, as an illustration. Five minutes ago he came in here mad as h——. He said that we didn't know our business, that all we were after was his money and as long as we could slip it over on the owner and get his dough we were happy. Of course, we don't often get them as unreasonable as that, but anyhow when he got through cussing us out he explained that his engine still knocked, although we had worked on it all day the day before.

Concede Battle Lost Too Soon

"The trouble with most men is right here. When they have an irate customer on their hands they concede that the battle is lost before they start, so their comeback is usually ineffectual and unconvincing.

"I find that it is fun as well as good business to win them around, and I usually do.

"In this case I got out the job order, which was signed by him, calling for carbon removal and valve grinding only. I called the shop foreman, and he stated that this was all the customer wanted done and that the work was asked for in such a rush that there had been no time to test the car either before or after and that this was marked on the job card.

"By degrees he calmed down and by careful diplomacy I finally got him to admit that we were right and that he was wrong. During this discussion every effort was made to impress him with the high ideals to which we were working so that next time there is any misunderstanding he will wait to hear our side of the story before going up in the air."

I was interested and pressed him for more information. He responded, "Yesterday a man came in with ignition trouble. He had a dual system and in attempting to overhaul it had put the magneto side of it entirely out of business. I took a look at the car and then stepped into the office for an instruction book giving a wiring diagram of that system.

"When I returned with the book, he made some sarcastic remarks about studying at someone else's expense and got ready to leave.

"'Just a minute,' I said, 'before you go let me ask you whether you would prefer me to fix your car in 10 to 15 min. aided by this little diagram or for me to fool around an hour or more behind closed shop doors without the book? I am glad to admit that I can and do use a book when I can save time that way and thus cut down your repair bills. There isn't a repairman alive that can carry all these systems in his head, but many would rather bluff you than run the risk of your disapproval. Most men would poke around blindly until they got the wires straight, but time may be saved by having these instruction books and using them.'

"In this case I almost lost a good customer by being up to date, and it was only by taking pains to explain that I won him back.

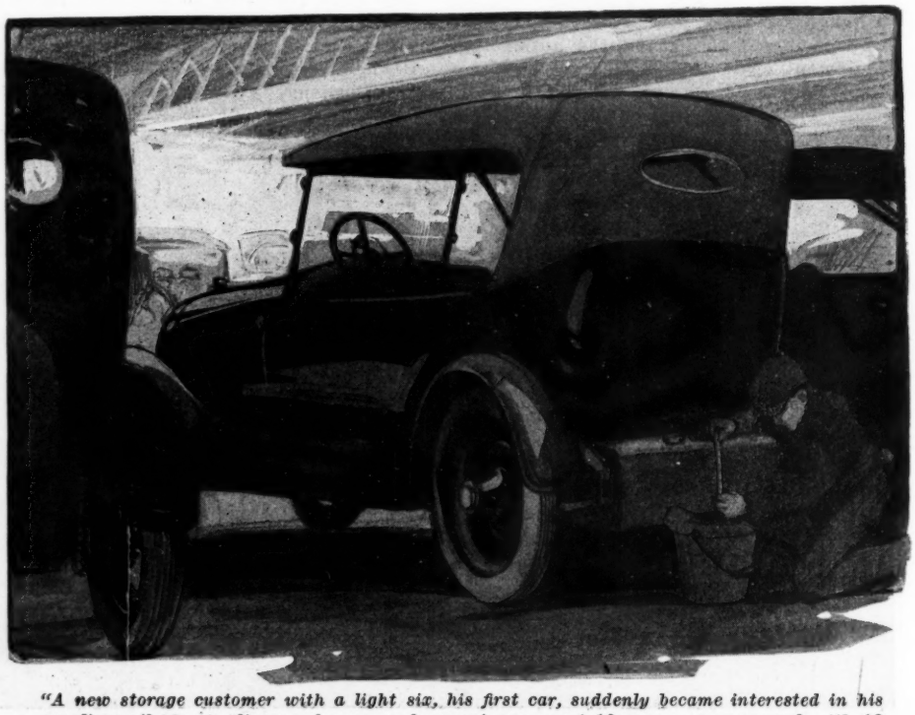
"A misunderstanding of this sort is not without its advantages, because this customer is now very much impressed with the methods we use around here and is in sympathy with everything I do."

Methods May Be Misinterpreted

This is a good illustration of how even the use of the most efficient methods may be misinterpreted. The garageman, repairman and car dealer must be on the job every minute.

"Quite often," Bill added, "it is a matter of keeping in touch with the customer's mind—to determine what he is thinking, for he may depart in a huff without giving you a chance to explain.

"Take George Fuller, for example. He had his car in here the other day for carbon removal. We were just finishing when he appeared at 5 o'clock to drive it home. In a few minutes we were done. We tried to start the car, throwing over the ignition switch and pressing the starter pedal but never a cough did the engine give. Minutes slipped by as we checked detail after detail without locating the cause. Finally



"A new storage customer with a light six, his first car, suddenly became interested in his gasoline mileage, to discover he was only running a scant 10 *m.p.g. as compared with* 18 *claimed by an overzealous salesman"*

in desperation we looked at the breaker points, filed and adjusted them and then the engine started. All this time the owner was becoming more and more impatient. I watched him. At first you could see that he questioned our competency and then our honesty. He seemed to be trying to find a motive back of the balky engine—all this in spite of our high reputation in the community.

"It was simply an unfortunate coincidence, and I told him so. No one had been near the breaker—there was no reason for touching it. Even if there had, it was against our policy to do so unbidden. So I finally convinced him, but it was hard work."

The Mysterious Mileage

This is one reason for the frequent accusation that repairmen make trouble to obtain additional work. Coincidences of this sort are rather frequent, and the repairman naturally is blamed. Bill Strong, well warmed up to his subject, continued, "A new storage customer with a light six, his first car, suddenly became interested in his gasoline mileage, to discover to his utter astonishment that he was only running a scant 10 m. p. g. as compared with 18 claimed by an overzealous salesman. He complained to the dealer, who told him that his car was perfect and hinted that perhaps he was not getting full measure.

"I accidentally stumbled on the fact that he questioned the quantity of the fuel, that he even wondered whether somebody wasn't stealing out of his tank nights. There was condemnation in his attitude.

"I saw the loss of a customer and a large spot of tarnish on our bright reputation so I took special pains not only to convince him that his suspicion was unfounded but also to determine the real cause of his high consumption. I provided him with a tank measuring stick, tinkered up his carbureter and then gave him some good sound advice on driving economy and kept at him until he followed it. And now he is getting 18 m. p. g. notwithstanding that the salesman's claim was high. The trouble was partly in his carbureter but mainly in his driving.

"I have run across a lot of men in the business who claim that they haven't the time to bother talking to their customers the way I do, but honestly I can't afford to do anything else. I consider I have two jobs: One is to keep my business running smoothly, efficiently and aggressively, and the other is to keep business and customers in tune. One disgruntled customer can do more harm than 100 happy ones, so I find it pays to prevent any dropping by the wayside.

Trouble with Newer Customers

"Most of my trouble is with the newer customers. The older ones and I are so thoroughly acquainted that there are no breaks, not even a ripple in our relations. Henry Barnard, who is a newcomer to town, got mad the other day because I wouldn't let him into the shop to watch the progress of the work on his car. In such an incident it is usual to explain that such is the rule and let it go at that, but this does not satisfy the customer.

"I told him it wasn't because we were ashamed of our shop or our methods but simply to protect our customers. We received many similar requests every day and if we granted them all, the interference with our work would be great. We found that every visitor to the shop took a certain amount of some mechanic's time and that the total was considerable. This wasted time was paid for by our customers. We saw a chance to cut repair bill costs by stopping this visiting, and we did.

"Not only was Barnard thoroughly appeased by this explanation, but he was completely sold on the methods we use by this single illustration. By taking the time to explain it to him, his objection to this shop rule was not our loss, but on the contrary gave the very opening I had been looking for to impress upon him indelibly the high character of our business.

"Most men miss this chance, because they won't talk. Instead of a firmly-cemented business friendship, they would have had a peevish ex-customer."

There is a good deal in Bill Strong's business ideas—philosophy, I was tempted to say. According to him, the first rule of success is:

1—Have a good business—something you can honestly talk about,

And the second rule is:

2—Talk about it, sincerely and convincingly, but modestly.

To gain full measure of success it is necessary to do more than hold the customer by cold business efficiency. Unless he occasionally comes under the spell of your warm personality as revealed by the ideals to which you are working you are not getting the most out of your business. It is the human, personal touch which clears away the doubts and misunderstandings which necessarily must rise to cause trouble in even the best run business.

New Tractors at Kansas City National Show

(*Continued from page* 11)

wheeled design in which the drive wheels, 42 in. in diameter, are in front and the two smaller wheels in the rear. The tractor is rated at 12-24 hp. and is intended for two plows. It lists at $1,450. The engine is a four-cylinder Buda 4¾ by 5½ in., and when running at 1000 r.p.m. gives 5.16 m.p.h. on high and 2.58 m.p.h. on low, which is the plowing speed. The engine and gearset are mounted practically over the front axle so 90 per cent of the weight is on the driving wheels. The axle is under the middle of the engine and is a Torbensen internal drive type the same as used on a 1½-ton truck.

The Automotive tractor is quite unusual in appearance and compact due to its total overall length measuring 108 in., its wheelbase 63 in., and its height 69½ in.

The system of transmitting power from the engine to the drive wheels is conventional, being through a Borg & Beck clutch in the engine flywheel and thence through a two-speed gearset. The propeller shaft goes forward from the gearset to the axle instead of rearward as in the conventional design.

Craig Redesigned

The Craig tractor has been quite redesigned since it made its first appearance last fall. A complete unit gearset and rear axle has been designed and is being built by Covert. The gearset gives two forward speeds, 3.86 m.p.h. on high and 2.4 m.p.h. on low. The drive wheels are 44 in. in diameter and with the 2-in. clips give an overall diameter of 48 in. With these wheels a gear reduction between the engine and wheels of 31.6 to 1 on high and 52 to 1 on low is had. The engine with these ratios gives the operating speeds of 950 r.p.m. The steering gear which used to be on the left is now on the right side, where it is more convenient. A Sylphon thermostat, placed in the water circulation system, controls the circulation. When starting it does not allow the water to circulate through the radiator until a temperature of 160 deg. is reached in the jackets. After this temperature is reached the circulation of water through the radiator takes place.

There is located at the base of the radiator an oil radiator through which the crankcase oil circulates and is cooled. A muffler is fitted. An improvement that appeals to all operators is a most comfortable seat which is larger than the average and is adjustable fore and aft as well as for side tilt. It is mounted on a leaf spring with an additional leaf spring as a safety one. In addition to this comfortable seat good fenders are fitted and there is a sheet metal floorboard which covers the hitch.

Other features of this remodeled Craig are Bennett combination water and air filter, Stromberg kerosene carbureter and brake on the countershaft of the gearset.

The P-T type of rear wheel has been somewhat modified. Timken bearings are used throughout the new design of combined gearset and rear axle. The Craig is a semi-frame type of machine in that the engine, gearset and rear axle constitute a single unit with the front of the engine supported on a short frame, supported through a cross spring on the axle. The tractor is rated at 15-25 hp. and takes three plows.

The New Bethlehem

A new tractor is the Bethlehem built by the Bethlehem Motors Corp., which has manufactured trucks for sometime. This tractor is an assembled product using a Beaver 4¾ by 6 in. vertical, four-cylinder engine and a Foote combined gearset and rear axle. It is rated at 18-36 hp. and designed for four plows. Its weight is given as 6200 lb., and it has a wheelbase of 89 in. It is a clean design of frameless construction, the Foote unit bolting direct to the Beaver engine and the only frame used being one supporting the front of the engine and in turn carried on a swivel above the axle. There is no cross spring between the small frame and the axle.

Using the Foote rear unit gives a complete inclosed transmission system. On high the speed is 3.3 m.p.h. with a reduction of 42.6 to 1 and on low the travel is 1.8 m.p.h. with a reduction of 82.2 to 1. The drive wheels are 54 in. in diameter with 12-in. face. The company has not gotten into production yet.

(*Concluded on page* 22)

Making Prospects by Letter

Problems and How to Solve Them in Direct Advertising Campaign

BUSINESS will not be normal until it is bigger and greater than before war time, that is, business must be what it would have been had the war not interfered. Merely getting back to where we were is the mistaken idea so many have of the word normal. As a matter of fact there is no such word as applying to the automotive industry. Normal means unvarying, and the automotive industry is increasing.

The dealer who is doing a normal business is a slacker, a slacker to himself because he is not up and moving with the industry. Of course, some dealers are 100 per cent faithful to themselves and to the industry, but they are the dealers who are drumming up business and taking advantage of every available opportunity to increase and better their business.

For car sales we suggest a mail-advertising campaign directly pointed at the prospective customer. In this form of publicity we are sure to strike the mark because we have aimed directly at him, and if we miss him it is because he intentionally has dodged it. But we are bound to get his attention because we have struck him unawares, that is, he has devoured a considerable portion of our publicity before he is aware he is being solicited. That is the secret of good publicity, and we believe the discovery of this secret lies in the series of letters suggested.

As an illustration of the success which may be achieved through the operation of this system, let us suppose we are opening up this campaign right now.

The first point of consideration is to solve the problem directing our publicity to our prospective customer who, in this case, is Mr. Jones, in such a manner that he surely will receive it and, next, read it. We know from experience a great deal of advertising matter goes no further than the wastepaper basket or, in other words, it takes a short cut to the basket by escaping the reader to whom it is directed.

There are thousands of wastepaper baskets filled with unopened publicity, because the receiver formed a general idea of the material within from the general appearance without. This being the case, the outside appearance must be camouflaged sufficiently to compel the receiver at least to open it. To do this is a point in our favor, but to carry him through inclosed matter is a matter of more difficult solution. The inclosed matter cannot be camouflaged and deliver the intention of the sender. It must be publicity, right from the shoulder and right to the point.

Material Must Be Read

Now the question rests before us: *will Mr. Jones read the material to the end after he is impressed that it is an advertisement?* To answer this question we must place ourselves in Mr. Jones' position. We will suppose that Mr. Brown is a banker, lawyer, broker or office manager of some very busy establishment. As we all know, plenty of mail constantly is pouring in to command his entire attention throughout the day, and the tendency is to set aside the less important mail until that which is most urgent is taken care of. We may direct our publicity to Mr. Brown so that, until he has opened it, he is unaware of the fact that it is unlike the other mail to which he immediately gives his attention, but as soon as the envelope is torn open the secret is revealed and our publicity immediately is set aside until later on or it is discarded immediately. No, we must devise some other way of hitting the nail on the head.

Some other method must be employed which will asure us that Mr. Brown will receive the effects of our literature. It appears that his office or place of business is the wrong place to catch him because he is devoting his entire time to business and feels that to spend a portion of his time to the studying of someone's publicity is a waste of time.

This would lead to the theory that he must be approached outside of the office or place of business, and outside of the office address there are but two places to catch him, his home, if he is married, or his club. We will say that Mr. Brown is a man who will be found at his home when not at his place of business. It is natural that he would feel differently about the manner in which he spent his time after leaving his office because, within all probabilities, his day's work is completed when he departs for home. All right then, we will address the home, but to avoid the possibility of Mr. Brown passing up our literature we will address it to Mrs. Brown.

Mrs. Brown is never too busy to open a piece of mail which is *directed to her personally*, and there is very little doubt of her reading it, especially if it pertains to the comforts of life. Every woman is interested in a car, especially if she has none. Every woman is interested in a car which is improved and more up-to-date than the one she has. Consequently, it is safe to direct our publicity to Mrs. Brown, and more than that it is safe to say that she unconsciously will act as our agent in the matter, because she will approach Mr. Brown on the subject, if she is at all interested. She will ask his opinion or in some way obtain his views on the matter and, of course, Mr. Brown must read the literature at least before he can pass his opinion. If this can be done, we have crushed the greatest obstacle in our

Letter No. 1

Dear Mrs. Gordon:

At all times of the year the closed car is comfortable and pleasant. In summer liberal ventilation and open windows make it open to any chance breeze. In winter it is easy to heat because it is protected on all sides.

Colonial town cars and limousines are receiving noteworthy consideration from people of means because of their style and comfort, unusual for the price.

We believe Colonial cars should receive your consideration also. At your earliest convenience, kindly please us by stepping in our showroom and have these beautiful cars presented to you.

Very truly yours.

Letter No. 2

Dear Mrs. Gordon:

Absolute cleanliness for the passengers, comfortable warmth, extreme ease of riding and the quintessence of style are the charms which only the owners of Colonial cars really and truly enjoy.

We ask you to accept our invitation to call. When you do you will find a most beautiful town car of excellent lines, finished exquisitely in every detail. It is the same with the limousine. Either body style is a gem of the coach maker's art and, mounted on the Colonial chassis, produces a combination which is beyond the criticism of the most critical.

Phone Drexel 1000 and ask for Mr. Carter, who will be glad to arrange for your coming by having a car at your door the minute you desire to come to our showroom.

Yours very truly.

Letter No. 3

Dear Mrs. Gordon:

You are interested in knowing why Colonial cars are preferred by women who know them.

Colonial closed cars, limousines and town cars are sold, principally, on the comparisons between Colonials at $3,000 and other makes costing from $4,000 to $5,000.

In addition to this value, our service, which is justly famous, is a part of every Colonial we sell.

Kindly advise us that we may send for you so that you may make your own comparisons. Just phone Drexel 1000 and Mr. Carter will arrange for a car to be placed at your disposal, that you may not be inconvenienced in the least because of your decision to inspect these beauties of our showroom.

Yours very truly.

Letter No. 6

Dear Mrs. Gordon:

Colonial cars are made for women, with their most exact requirements in view.

Gowns, no matter how delicate or expensive, never are endangered by soiling or tearing. There is ample room overhead for the comfortable protection of large and delicate hats. Your position is never uncomfortable.

Wide and easily opened doors, large, comfortable, roomy seats, heavy plate glass windows complete the totally unique distinction of Colonial closed models. This is particularly noticeable, even at a casual glance of the Colonial.

Kindly consider this a personal invitation. Phone Drexel 1000 and arrange with Mr. Carter to send a car for you.

Yours very truly.

Leter No. 4

Dear Mrs. Gordon:

This is your Colonial limousine, the car of aristocratic distinction.

A beautiful, large sample of the particular car and coach maker's art, appealing in the most minute detail. Extreme style and comfort place the owner's taste above criticism.

It is unnecessary to ask "Would such a car please you?" A greater value cannot be obtained at any price.

Your car is waiting here for you.

In this car you will realize all that you have ever imagined in a car.

The dreams of ease and comfort which the imagination creates in the mind as the essential of the perfect ideal car are found to be a realization in the Colonial.

Every day in the year calls for the closed car, and it is to your advantage to place your order now. Phone Drexel 1000 and ask for Mr. Carter. He will send a car for you.

Yours very truly.

Letter No. 7

Dear Mrs. Gordon:

A rather broad statement we are issuing but no broader than we can prove.

No better or more stylish and comfortable car can be built than you have in your Colonial limousine or town car. (Kindly remember that we have a Colonial car here waiting for you.)

The Colonial engine is perfect in its mechanism and permits no argument. Your limousine or town car costs you but $3,000.

If a limousine or town car is a part of your season's program, we naturally expect you to give the Colonial your attention. It is beautiful, and the one which we have chosen for you.

Prompt deliveries are possible at the present time but cannot be assured later on.

Of course, we shall be pleased to send a car for you at your convenience. Just phone our Mr. Carter and he will arrange for your appointment. Drexel 1000.

Yours very truly.

Letter No. 5

Dear Mrs. Gordon:

Just four weeks ago Mrs. Parkhurst purchased a Colonial.

When asked why she chose the Colonial after having inspected other makes, she replied, "It gives my family all that can be asked for in a closed car, regardless of other makes which are much higher priced, and we are satisfied that in buying a car from a company whose reputation is so unquestionable as yours we are amply protected, both in the service of the car and in the service of the company who sold us the car."

We believe you will be of the same opinion as Mrs. Parkhurst when you have become acquainted with the Colonial and the service we render our patrons.

It would please us to explain the Colonial and our service to you, to-day, if possible. Just phone Mr. Carter, Drexel 1000, and he will arrange to have a car sent for you.

Yours very truly.

Letter No. 8

Dear Mrs. Gordon:

Rain, wind, snow and cold cannot reach you if you follow our advice.

A Colonial limousine or town car is your protection and will give you and your family absolute ease and comfort of a new kind, mental as well as physical.

Regardless of whether it is for social duties, shopping or the theater you will find your Colonial master of every occasion.

Do not delay another day. Your car is here for your inspection, so see it to-day. Convince yourself that the broadest of our statements are within the comfort and performance of the Colonial.

Phone to us to-day, Drexel 1000. Ask for Mr. Carter and he will be greatly pleased to extend every courtesy to you. We desire to call for you before to-morrow. Will you, please, tell him to do so immediately?

Yours very truly.

path which leads to the sale of the car. We have dodged the wastepaper basket.

Having decided that this is the proper way of obtaining Mr. Brown's attention we next must decide on the manner in which we will hold his attention until we have brought about the desired effect, the sale.

Neat and attractive literature explaining the merits of the car as to its qualities of comfort and reliability are of the greatest importance. The manufacturer in most cases has arranged for this and supplies the dealer, but where this is not the case it is to the dealer's benefit to produce this literature of his own accord.

As a basis and a guide for our campaign we will adopt one certain system which has exceeded the expectations of several dealers.

This campaign was directed to a selected list of 3000 women socially prominent. Special color effects were used, and in some cases the letters sent were in the form of social invitations. The envelopes were addressed in hand writing without the sender's name appearing.

Division of List

In the mailing of these 3000 names, they were divided into ten lists of 300 each. Letter No. 1 was mailed the opening day of the campaign to the first 300. The following day the next 300 were mailed, and so on until letter No. 1 had been directed to the 3000 women, which required ten days. Three days after the opening of the campaign, letter No. 2 was forwarded to the first 300 and the fourth day, to the second 300 and so on, until No. 2 had been sent to the entire 3000. A new letter was started every fourth day until the last of the series had been mailed. Spreading the mailing of the letters through several weeks permitted checking up the results from the system.

In each letter the name of Mr. Carter appeared as the man to which they should apply for any information regarding the car, but as a matter of fact there was no such person as Carter in the concern's employ. By using this name the results obtained from the campaign could be checked. For example, if a party called on the telephone or personally and asked for Mr. Carter, it immediately was known the campaign was responsible for the call.

NEW TRACTORS AT SHOW

(*Concluded from page* 19)

Holt has two new farm tractors as a result of the military development by this company. In both the major improvement is the almost complete use of Hyatt bearings in every part but the engine. Hyatts are used in the gearset and on the sprockets and idlers that carry the caterpillars in place of plain bearings. The 5-ton model for four or six plows uses the modified class B standardized truck engine, in which the valves are in the cylinder head. The cylinders are 4¾ by 6 in. It lists at $3,300.

The larger Holt, for eight plows, uses the Holt engine 6½ by 7 in. four-cylinder vertical and was designed to draw the 155-mm. guns. Both Holts burn gasoline or distillate.

A magneto with special fittings so it can be used on the Fordson tractor is shown by the American Bosch Co. Four bolts attach the magneto bed and the cover for the train of gears to drive the magneto. The timer is removed, and the gear to drive the magneto fitted in its place. Between this gear and the magneto gear is an idler. The train of three gears is well inclosed. Two bolts hold the magneto bracket, or bedplate, onto the crankcase. The complete magneto equipment includes ignition cables and tube to head them as well as control attachments. All can be attached without drilling a single hole, and the installation can be made in 4 hr. The waterproof magneto equipment complete lists at approximately $80 and the standard type at approximately $65.

Garage Men Take Steps Toward National Association

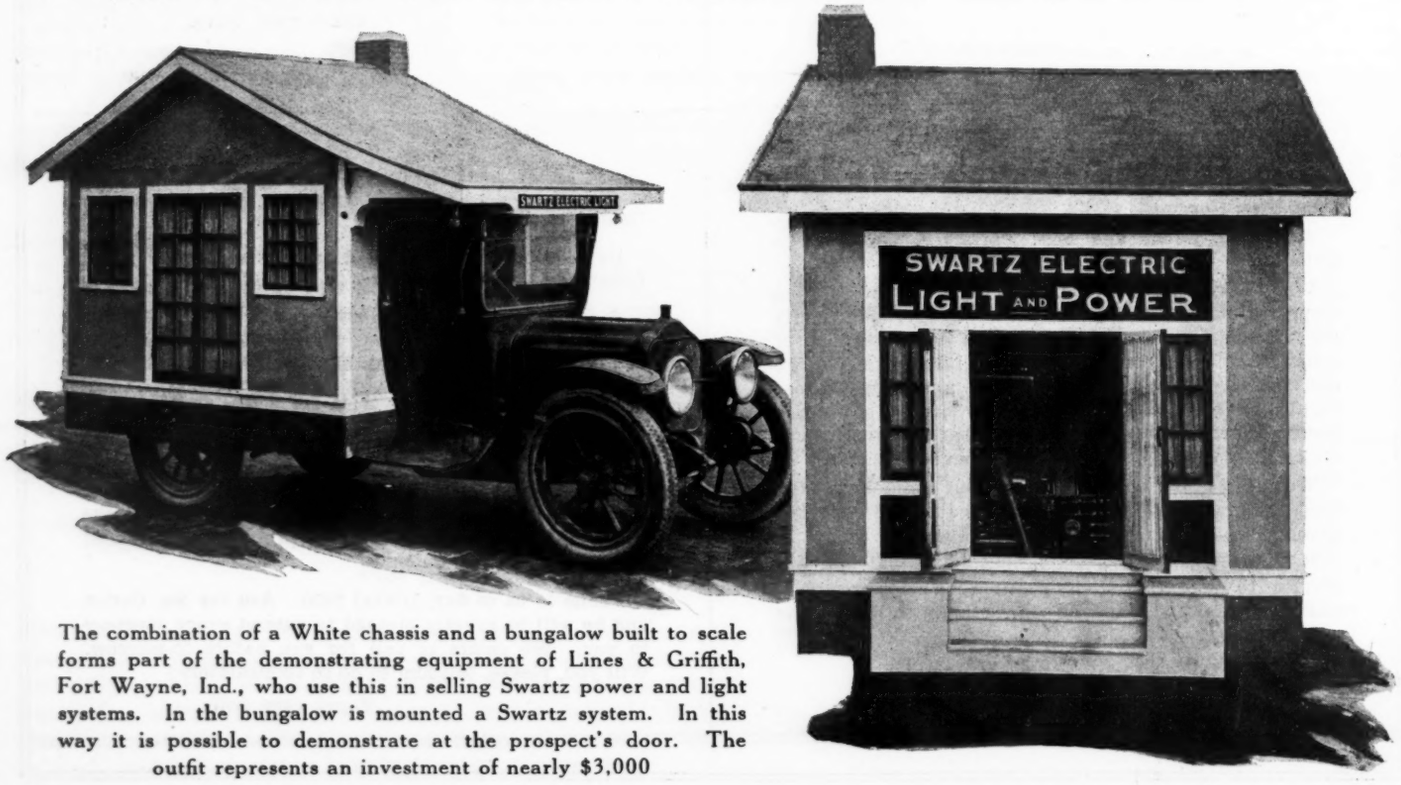
MINNEAPOLIS, Minn., Feb. 21—More than fifty motor car, garage and service station owners and managers met here Wednesday and took preliminary steps toward the organization of the National Automotive Repair Association. Arthur Sparling, owner of a garage at Langdon, N. D., was made president; M. H. Gavin, Minneapolis, vice-president; R. W. Kuhnnau, Heron Lake, Minn., treasurer, and David W. Onan, Minneapolis, secretary.

The object of the association is to organize the automotive repair men of the country as the one factor in the automotive trade which hitherto has not had adequate representation in any of the many associations connected with the industry.

An aggressive campaign will be undertaken for membership, and the first annual meeting of the association is planned for Minneapolis during the Northwestern Automotive and Industrial Exposition in 1920.

One of the most important of the things which such an organization could accomplish would be to bring pointedly before the engineers responsible for the design and construction of motor cars the desirability of making their product more accessible and easy to repair. It is claimed that as cars are at present constructed the work of repair is made unnecessarily difficult, entailing heavy expense upon the motor car owner and putting the repair man in an embarrassing position where he has to charge heavy time rates for relatively trivial repairs.

Another thing which the organization will work for will be better treatment from motor car manufacturers in the matter of prices for repair parts. Also it is hoped to raise the standard of mechanical ability in the repairshops of the country.



The combination of a White chassis and a bungalow built to scale forms part of the demonstrating equipment of Lines & Griffith, Fort Wayne, Ind., who use this in selling Swartz power and light systems. In the bungalow is mounted a Swartz system. In this way it is possible to demonstrate at the prospect's door. The outfit represents an investment of nearly $3,000

Better Business Methods for the Dealer

By Henry Paulman*
Chicago Pierce-Arrow Distributer

A MAN entering the motor car business will be required, first, to select a suitable location. This is a subject that requires very careful thought. The location of the salesroom should be convenient to the public and should be placed in the path of the greatest number of people. Rent and overhead are secondary considerations, providing the location gives you the proper volume of business. It has been demonstrated time and time again in Chicago that higher rents on Michigan avenue are cheap in comparison with rents on Wabash avenue, a good business thoroughfare, one block west. This is due to Michigan avenue being a boulevard and carrying a greater percentage of motor traffic and there being no streetcars to interfere with this traffic, making the approach easy. It also has been demonstrated that salesrooms in certain blocks where the big advertisers are located draw more buyers than locations nearer the heart of the city.

Type of Building, Store Decoration and Lighting

The National Automobile Dealers' Association should assist in developing industry. This idea can be developed along the lines followed by the various large banks throughout the country, which have adopted the classic type of architecture. Every Roman temple that you see as you travel about the country is representative of a banking institution.

Both in New York and Chicago we have all seen very decorative salesrooms. Dealers do not pay sufficient attention to the appearance of their salesrooms and also neglect the electric lighting effects. I have always held the opinion that electric lighting well distributed in a salesroom is the most effective and cheapest form of advertising. Interior decorative schemes are not given the consideration that they deserve. It is very desirable when customers enter your salesroom to have them favorably impressed with the harmony and taste displayed. It is always advisable to carry out a neutral effect as near as possible to have a suitable background for the color schemes developed on the cars you have on the sales floor. Bright colors in interior decorations detract from the goods you are attempting to sell. The effectiveness of proper interior decoration can be best illustrated by a number of the big banking houses in LaSalle street. A man will walk into the Illinois Trust, the Northern Trust or the banking room of the Continental & Commercial. A certain confidence is instilled in a customer as soon as he steps inside one of these awe-inspiring buildings, which immediately gives him a feeling of extreme confidence. This is an element in sales psychology which is very effective.

Financing

A prospective dealer with a limited amount of capital should arrange to make a desirable connection with a good bank. I would suggest that before this bank connection is made he visit two or three of the banks located in his particular city and secure suitable credit accommodations. As soon as a dealer has sufficient funds he should endeavor to develop two bank accounts with two separate institutions, as I feel from my experience that this is far better business than to rely entirely upon one banker. Few men entering the motor car business, or in fact any business, appreciate that a banker is a merchant of money. His business is to sell money at the best possible rate of interest. It is, therefore, perfectly legitimate for the dealer to secure as much money or credit as his trading ability will permit at the lowest rate of interest.

A good dealer will borrow money at 5½ per cent and thereby not only increase his volume of business but make money on the interest by placing it at 6 per cent and 7 per cent on time payments. A wise dealer also will borrow money at 5½ per cent and discount his bills on which it is customary to allow a 2 per cent discount. This discount amounts to 24 per cent at a minimum per annum. A dealer also should attempt to secure at least five turnovers per year. It is very difficult to make a profit unless he can secure at least that many turnovers. The dealer who can secure seven or eight turnovers on his capital each year should make a very good profit. It might be well to illustrate this point by stating that the average stockyards packing concern has approximately twenty-four turnovers a year, while the fertilizing companies have but one turnover per year. It is, therefore, easy to understand why the packing company is a more profitable business than the fertilizing business. The opportunities for making money are twenty-four times greater in the one enterprise than in the other.

Getting It Down in Black and White

Read this over carefully

Date

To

Dear Sir:

We agree to

6½ INCH SPACE FOR DESCRIPTION OF WORK

Car No._____ for a net amount of $_____ work to be guaranteed, done consistent with proper attention and all parts and material to be of the best quality obtainable in our judgment for the purpose intended.

If the above agreement is satisfactory please sign the attached order and return.

H. PAULMAN & COMPANY

Per_____

To
H. PAULMAN & COMPANY
2301 Federal Street
Chicago

From

Gentlemen:

Your agreement of_____ to do certain specified work on my car No._____ for a net amount of $_____ to be paid by me upon completion of work, is hereby accepted and the signature attached is your authority to proceed with the work in accordance with terms set forth in above mentioned agreement.

Signed_____

Date_____

Per_____

Bookkeeping and Auditing

The average dealer is of the opinion that books are kept only so that his accounts may be kept square with the customer. This, of course, is very important, but it is still more important for him to know the cost of operating his business. In one firm that I am well acquained with there are 11 accounts of internal transactions which are necessary to furnish the correct information as to the profit and loss in its five departments. It has required a number of years of experience to develop a satisfactory system of bookkeeping, suitable for the retail motor car business.

No dealer should operate his business without taking a complete inventory, setting up proper reserves for ample depreciation at least every six months or, better yet, every three months. This may seem a useless amount of detail work, but I know that having this accurate information available has paid handsomely in guid-

*Talk before N. A. D. A. at its Annual Convention.

ing the policies of a successful dealer's business. When the leaks are positively shown, ways and means are quickly found to correct them. In this connection the greatest difficulty the dealer has to contend with is the resale of used cars. Accurate records will keep him informed as to the selling cost of used cars. For the same reason every dealer should departmentalize his business. After the departments have been properly organized each one should be made not only self-supporting but profitable. Two methods may be adopted in respect to pro-rating overhead expenses, first, by space occupied and, second, on volume of business. All expenses, however, should be charged directly to each department where this is possible. This will show the departments that are profitable and the departments that are unprofitable. An agency should be divided into five parts, as follows: New Car Sales, Used Car Sales, Trucks, Service and Sundries. This procedure soon will show which departments are in the red figures.

Budgeting

Modern business practice requires a budget, which is really a forecast of your total expense for the ensuing year. It is necessary, first to estimate the approximate volume of business you will do and on that volume pro-rate your expense. This will give you an opportunity to appropriate fixed sums, which will govern your expenditures during the coming year. A number of dealers have become so proficient in budgeting that they are able to estimate within $1,000 of the profits they will derive for the ensuing year.

Sales

The problem of sales, salesmen, sales records and sales plans have been so thoroughly discussed by well-known authorities that I will say very little on these subjects. The greatest weakness of the average dealer is his inability to secure the list price for his goods. There have been at least half a dozen dealers who have failed in Chicago for the reason that they did not have the courage to maintain the list price. A buyer of a motor car is usually a good business man and, therefore, a good trader and good buyer. Unless the dealer of his sales organization is equally skillful the buyer will secure the car at a concession. A customer who has secured a special price usually delights in giving this information to his friends. When this takes place the following is the result: The buyer will attempt to secure all the free service that he can. The dealer, owing to his having made no profit on the sale, will not give the buyer the service he legitimately is entitled to. The result is that the customer is dissatisfied not with the car but with the service. Dissatisfied customers kill the dealer.

In the distribution of our selling force it has been demonstrated that young salesmen do better in selling lower-priced cars. Older men are more satisfactory selling higher-priced cars. It has been found that salary and commission plus a bonus has been the most satisfactory form of compensation. In our carding of prospects the house is protected by having the privilege to reassign prospects that salesmen fail to call or report on within thirty days. If salesmen fail to report on a live prospect within fifteen days, the house reserves the right to reassign this prospect to another salesman.

In this reassignment we are governed by the nationality of the prospect and of the salesman, religion of the prospect and the salesman, line of trade, fads, secret orders. We avoid sending a German to call on a Frenchman or a salesman with very little mechanical knowledge in attempting to sell an engineer. Every effort is made to have these factors carefully balanced. A correct sales record is kept by the house and a record of all transactions with the customers, showing us instantly whether our past dealings were profitable or not profitable. These cards are kept in a convenient location in the salesroom. With this information quickly available we are governed as to whether we should be liberal or rigid in the trade allowance on a prospective sale.

Resale of Used Cars

I might say in our business to-day the dealer cannot eliminate the handling of used cars. I feel that the best method of meeting this situation is to instill confidence in the buyer of used cars. Develop a used car market by guaranteeing used cars. We have a form of guarantee which is divided into four classes, namely, classes A, B, C, and D, which are as follows:

Class A

Insufficient mileage since new to need repairs other than minor adjustments; carry same guarantee as if new.

Class B

Car overhauled and all necessary replacements made and will give same service as new car for an indefinite period without rebuilding. Carries our standard guarantee.

Class C

Car has had partial overhauling and will give satisfactory service. Sold without guarantee.

Class D

Car in which the selling price does not warrant any mechanical work by us, although good serviceable cars. Sold as is.

This will instill confidence in the buying public and create a receptive market. This plan has proved very satisfactory in two of our local used car shows which were held at the Coliseum. A technical committee was appointed which carefully examined

H. PAULMAN & COMPANY
PIERCE-ARROW MOTOR CARS
2301 FEDERAL STREET
CALUMET 8960
CHICAGO

Date

To

We have made as careful an examination of Car No._____as conditions will permit without disassembling. We find it is (ADVISABLE/NECESSARY) to do the following work:

4¾ INCH SPACE HERE FOR DESCRIPTION OF WORK

for which we would approximate the cost about $_

This is NOT an agreement to do the work at the figures mentioned. Charges will be made on a labor and material basis and bill rendered accordingly. Payment will be requested for such amount as is in excess of $_____. Should the charges not equal our approximate figure you will be asked to pay only such amount as is made necessary by the labor and material charge.

Any further work must be authorized by additional orders and will be charged for on a labor and material basis as it cannot be considered in the above approximated figures.

If the above is satisfactory please sign the attached order and return.

H. PAULMAN & COMPANY

Per_____

To H. PAULMAN & COMPANY
2301 Federal Street
Chicago

From

Gentlemen:

Your approximate figure of $_____to do such specified work as is contained in your communication of _____is understood by me not to be an agreed price for doing the work desired.

By attaching hereto (MY/OUR) signature I authorize you to proceed with the work and do it as expeditiously as is consistent with proper attention and for which I agree to pay the cost of same, when a statement giving the amount made on a labor and material basis is rendered me.

Signed_____

Date_____ Per_____

Agreement entered into with owner after an examination of his car

cars and would not accept same unless the side curtains, bumpers, motor, transmission, rear axle and every part of the car was in good serviceable condition. After the cars passed this examination the committee's tag was sealed to the car. The tag could not be removed without breaking the seal. The public soon appreciated this protection, and it resulted in a large volume of used car business.

After a car is traded in at a price of $800 and $150 is added to it in the way of paint and overhauling, a commission of 20 per cent should be added to the $900 to cover your selling expense, and this should then become the list price on the car. A used car department should be made self-supporting. The used car should be sold in a separate department by salesmen whose time should be devoted to used cars entirely.

Advertising

Sixteen years of experience has taught us that wise advertising is a very essential adjunct in the motor car business. Circulars, catalogs and booklets properly developed have paid out handsomely in the increased business secured for our sundries department and repairshop. Improvements in later model cars that can be attached to the earlier cars have assisted us greatly in increasing the volume in our shop. This item alone, spread over a period of years, has increased our volume thousands of dollars. The sum appropriated for advertising should be governed by the volume of business done and should never be less than 1 per cent and never greater than 1½ per cent.

Service

To illustrate the effect of service on business I would like to cite two incidents that have happened to me in my business relations with the greatest organization in the business world, namely, the Standard Oil Co. A great many years ago while running a garage we had an unexpected warm, sunshiny Sunday, and the great demand for gasoline emptied our tank very early in the day. We called up the dealer who was furnishing us with gas and asked him to refill it, but, it being Sunday, he could not accommodate us. We then called up a representative of the Standard Oil Co. He managed within 3 hr. to get out his driver, hitch up his horses and again fill up our tank. This service made us a Standard Oil customer, which we have been ever since.

About a month ago I had occasion to buy three soft shirts to wear while playing golf, which I instructed the salesman to have cut off at the elbows. These shirts were delivered to me by Marshall Field & Co., but my instructions had been overlooked. I tried one of these shirts on and had it marked at the elbows and my wife, having a seamstress at home at the time, I was going to have the alteration done at home but on making inquiry the following day found that Marshall Field had discovered their error, sent their wagon to get the shirts, brought them back to the store and made the necessary alteration. It is needless to add that I appreciated this service sufficiently to say that this house will have my business for a good many years to come. These companies are the largest in their respective fields and illustrate the importance of service as it relates to building up large business institutions.

The proper administration of the service department can either make or break a dealer. Your service superintendent should not only be a man with technical knowledge but a salesman as well, with a good personality. This individual can do more to promote the sale of cars through his actions in generating good will than any one salesman in your employment. More dealers have failed through neglecting this feature of their business than through any other one cause.

The good will of a satisfied customer is your greatest asset. Without it you cannot succeed. Mechanical record cards should be kept on every car in your territory on which you are rendering service. A working plan on service should be developed between the factory and the dealer and the dealer and the customer somewhat along this line. This working plan should be on a mileage basis. For the first 5000 miles of service, should any difficulties develop, the expense of these should be born by the factory. The second 5000 miles, should any mechanical difficulties be developed, the parts should be furnished free by the factory and the labor billed to the customer.

Many conscientious dealers have failed through representing cars on which the mechanical maintenance expense was so great, through poor design and defective construction that the service burden was more than they could carry. Much dissatisfaction has arisen through service managers not estimating carefully the amount of time required for necessary mechanical work. Not having this car ready at the time promised has caused a great deal of complaint. Should the service manager find that after the car is in he cannot complete the work within the time promised, he immediately should notify the customer. This will avoid dissatisfaction.

Service does not mean giving the customers something for nothing. It means maintaining an efficient repair organization with an ample stock of parts so that the customer's car will receive the needed attention with the least possible delay at a minimum expense.

Parts Department

A great many dealers neglect their parts department and do not give it the time and attention that it deserves. We have endeavored to keep our parts department up to date by carrying a perpetual daily inventory. Our policy then is to carry parts on hand for cars three years back. We then endeavor to reduce our stock to a minimum on all parts on early models. We feel that all parts ought to be depreciated on the basis of 33⅓ per cent. With this plan, parts dating back beyond the three-year period will represent no investment. A great deal of capital is tied up in the parts department and places you in the same position as a poor merchant who has obsolete stock on his shelf. Parts, in our opinion, dating back further than three years are obsolete and, therefore, should represent no value.

This year, owing to the increased price of parts during the past twelve months, 20 per cent reserve for depreciation should be set up to provide for a reduction in the price of parts is bound to come during the next eighteen months.

Sundries

Many dealers neglect the sales possibilities of sundries. This department can be made a very profitable part of your business. From my personal knowledge I know dealers who have established these departments on such a profitable basis that they more than carry the entire service expense. The sundries department should be located adjacent to the office of the service manager, to permit your sundry man to have the proper point of contact with the customer whenever he calls for service. This gives him an opportunity to make a great many sales of useful sundries.

Your sundries department can handle with profit, tires, oils and grease, sundries and insurance. One car agency in the east has developed an insurance department which nets it over $6,000 a year. This also gives them the added advantage of being able to do all the repair work on the cars which carry their insurance. Another company has developed a radiator cover. The volume of business secured on this item has amounted to over $3,000. Another company has developed a spotlight. The volume of business done on this spotlight has run into many thousands of dollars. I feel this is one of the greatest dealer fields.

It may come to pass that competition during the next five years may become so keen that the net profit on the sale of cars will become less and less each year. Therefore, profit will be derived from the careful development of various special departments which can be made to pay in conjunction with the automobile dealer's regular business. A business organized along the lines suggested here will permit a proper balance of stock, which at the present time tends toward lower prices on tires and other commodities that have to do with the operation of the motor cars.

Active Market Forseen

It also forecasts that the dealer who is in business at the present time and who carries a large stock of passenger cars will find, in my opinion, a very active market for all the cars he can secure during the coming spring months. Sell the cars that you are able to secure at the list price. Be very careful of your trades for in my opinion there will not be sufficient cars available to meet the demand of the buyers.

In conclusion, the National Automobile Dealers' Association should assist in developing a representative design of sales buildings, should encourage the dealers to use a standard form of guarantee to build up a satisfactory used car market and should encourage a standard service policy.

Every dealer should assist in forming a local trade organization, as modern business and the business of the future can be encouraged more through business organizations than through any other methods. The $60,000,000 good roads bond issue recently passed by Illinois would not be in existence to-day, were it not for our local trade organization. The Chicago show of 1919 would not have been held, were it not for our local organization.

Motor Car Men and Tractor in Great Northwest

By Fred M. Loomis
Motor Age Editorial Staff

MINNEAPOLIS, Minn., Feb. 21—That the motor car dealer will be a permanent factor of importance in the tractor trade of the Northwest is indicated by the fact that the most productive dealers up to the present time have been automotive dealers. While here and there the old-time retail implement dealer has made a qualified success of the tractor business, still it is a fact well worth attention that those dealers who have made the most substantial progress in introducing tractors into the territory have been either exclusive motor car dealers or dealers who handle motor cars and farm implements.

The man who knows best what is going on in that territory is the man on the firing line, namely the tractor salesman representing either a distributer or a factory direct. It is up to him to make his territory pay. His very existence depends upon his ability to analyze his territory and to develop its possibilities to the utmost. He comes into closer contact with conditions as they exist, and it is his job to make his business fit those conditions.

Every Distributer Is Pioneer

Every man to whom is entrusted a territory is essentially a pioneer, not in the sense that he is introducing a power factor to the farmers of the Northwest with which they are unacquainted, for really it is in the Northwest that the tractor was born and first assumed importance as an agent in agricultural operations. But power farming as it is understood to-day is different from the early days of the tractor and the tractor itself now being put into work in that section is not, fortunately, the same kind of machine that was originally sold to the Northwest. The modern tractor is so different and the methods themselves are so different that it may be said a veritable revolution is taking place. It is a revolution, too, which cannot progress along definitely determined lines, because conditions never are the same in any two localities. The tractor salesman must be able to distinguish between any two sets of conditions and adapt his selling methods and his products to whatever he finds. The successful salesman is he who gains the clearest conception of what he is up against and who most nearly adapts himself.

For instance, take North Dakota. This is a one-crop country. Diversified farming, as the term usually is applied, is so exceptional as to be almost unknown. Spring wheat is the dominant crop. The Red River Valley, as an instance, is famous. It is an ideal tractor territory. A tractor and a truck will motorize the average farm, but the very uniformity of conditions introduces a time element in tractor sales which is unknown or the exception elsewhere. Also, the distances complicate the service problem. How is the tractor salesman as representative of a tractor manufacturer meeting these conditions?

S. L. Copeland travels a relatively small territory, as territories go in the Northwest, in the vicinity of Fargo, N. D., for the Wallis Tractor Co. In the first place Mr. Copeland himself is sold on the tractor. He believes in it. He has vision as to the future of the tractor trade in his territory. He realizes that he must make his selling methods accord with the local conditions as respects time sales and to service.

Service is the main problem. Distances are vast in North Dakota. The season during which the tractor can be used is short. It must be kept continuously in service during the season of its use. Fargo is far from Racine. The factory service man is not a possibility. The dealer must be the service man and look after the tractors in his vicinity.

Therefore, when Mr. Copeland makes a tractor contract with a dealer and gives him an appreciable territory he insists upon two things. One is that the dealer shall carry an adequate stock of spares, so that he shall be in a position instantly to furnish any part which may be needed by any Wallis Cub owner in his territory.

Second, he must have in his employ a competent service mechanic. No chance is taken on this man. Some man, preferably with previous experience with motorized equipment, is selected and sent to the factory at Racine. There he is put on the payroll of the Wallis Tractor Co. and is set to work in the factory. He stays there until he is thoroughly acquainted with the Wallis Cub. He then goes back to North Dakota and becomes the service man for his original employer.

Already several such men have been sent from Mr. Copeland's territory to Racine and have received training in the Wallis factory and at the temporary expense of the Wallis Tractor Co. The advantage of this is that through insistance upon adequate service equipment, both in materials and men, the dealer is put into a position where he can render the right kind of service and make his tractor business satisfactory to his customers and profitable to himself. This is constructive salesmanship. This is the sort of thing which puts the motor car or the automotive dealer into the tractor trade for keeps.

Not all dealers provide themselves with service equipment to the same extent. However, some of them do. An instance of the latter is furnished by Charles Himrich, Fessenden, N. D.

Mr. Himrich has been an implement dealer for years. Once upon a time he added motor cars and sold them for a time but eventually dropped them and became again an exclusive implement man. His experience with motor cars taught him, however, the necessity for service equipment in an automotive business; hence, when he took on tractors he did not hesitate an instant in preparing himself. He realized that only first-class service could put across the tractor trade. In addition, therefore, to his store and repairshop he has bought a 2-ton motor truck. This will be used for the delivery of new tractors and as an emergency service wagon and a final means for the transportation of a disabled tractors from the farm to the shop for repairs or overhauling when it is necessary so to do.

Mr. Himrich is of the class of dealers who, Mr. Copeland says, are the most suc-

How Shannahan & Wrightson of Easton, Md., who handle Nash trucks and Avery tractors, use one to deliver the other

cessful of the North Dakota dealers, namely, the implement dealer with motor car experience.

Mr. Copeland has been in his small territory only since last July. He now has sixteen dealers, a third of whom are automotive dealers, and so far this third has been the most productive. Last fall, at which season the tractor trade is at its best in North Dakota, thirty-five Wallis Cub tractors were sold. The prospects for the ensuing year, owing to the class of dealers and the quality of service they are giving, promises much better.

North Dakota is a one-crop country, as has been said. Farmers are unusually flush just after the wheat is harvested and sold. It has always been the custom to buy farm equipment payable the October following the purchase. Thus many, a majority in fact, of the tractors sold in this section are sold on what is practically a year's time. Tractor notes bear 8 per cent interest, and if the dealer is careful to whom he sells, these notes are readily discountable at the local banks. The dealer, however, pays cash for the tractors he buys. Thus it is evident that the dealer must have capital, standing at the bank, intimate acquaintance with the financial responsibility of the farmers and be a good judge of credit if he is to succeed in the tractor business of North Dakota.

Furthermore, the motor car dealers or the automotive dealers who have gone into the tractor business during the last year for the most part will stay in the business. Mr. Copeland says in general a motor car dealer has the best preliminary organization for tractor service, but unless he also has the parallel implement experience he must acquire this later.

In connection with time sales on tractors the attitude of the banker toward the tractor has changed for the better materially during the last six months or so. Prior to that time, for reasons well known to anyone acquainted with past facts in this section of the country relative to the kind of tractors which first were sold, the banker rather discountenanced financing tractors. He is veering the other way now, making it much easier for the dealer.

Two men who realize the importance of the work the salesman must do in developing the dealer into a satisfactory tractor salesman in the Northwest are Ed Moyer, Aberdeen, S. D., who represents the Avery Co , and L. A. Turner, Huron, S. D., representing the same company.

Both men say it is necessary to take the automotive dealer and convert him first to the theory and practice of power farming and then show him how he can make money on tractors. Once convinced, there is no further difficulty about keeping him in line and enthusiastic over the tractor trade. Mr. Moyer says that in his experience he believes the best dealer is the motor car man. In the first place he has a better equipment for service, and then he goes out after the tractor trade and does not sit around and wait for it to come to him, as does the average retail implement dealer. Mr. Turner says in his particular territory he has six or seven dealers who produce a large and satisfactory tractor business, all but one of whom are motor car dealers.

As an instance of what can be done toward developing a motor car dealer into a producing tractor dealer, Mr. Turner cites the case of Smith & Tilgner, Northville, S. D. Considerable preliminary work was required to induce this concern to take hold of tractors at all. Now it is exclusively a motor car and tractor business. In addition to the Avery the company handles the Gray and during 1918 sold ten Averys and twenty-five or thirty Grays, the latter tractor being peculiarly adaptable to conditions in that locality. Another motor car dealer who has made good and who everlastingly will make good in the tractor trade is A. M. Arquhart of Huron, S. D., who sold fifty Averys last year.

F. J. Cone, sales manager of the tractor division of the Emerson-Brantingham Implement Co., Minneapolis, Minn., is not quite so enthusiastic about the motor car dealer as he might be. By the same token he takes something of a fall out of the implement man. He says that not 30 per cent of the retail implement dealers are capable of selling tractors and that not over 10 per cent of the motor car dealers are competent. The result is that the traveling salesman must make dealers. That Mr. Cone or his representatives have been successful here and there the two following instances would indicate.

The Fancet Auto Co., Watertown, S. D., with the aid of the E-B man, managed to dispose of about fifty tractors last year, while the firm of Wegner & Perwitz, Marshfield, Wis., sold about thirty. The latter firm is now in the class of automotive dealers and has thoroughly departmentalized business.

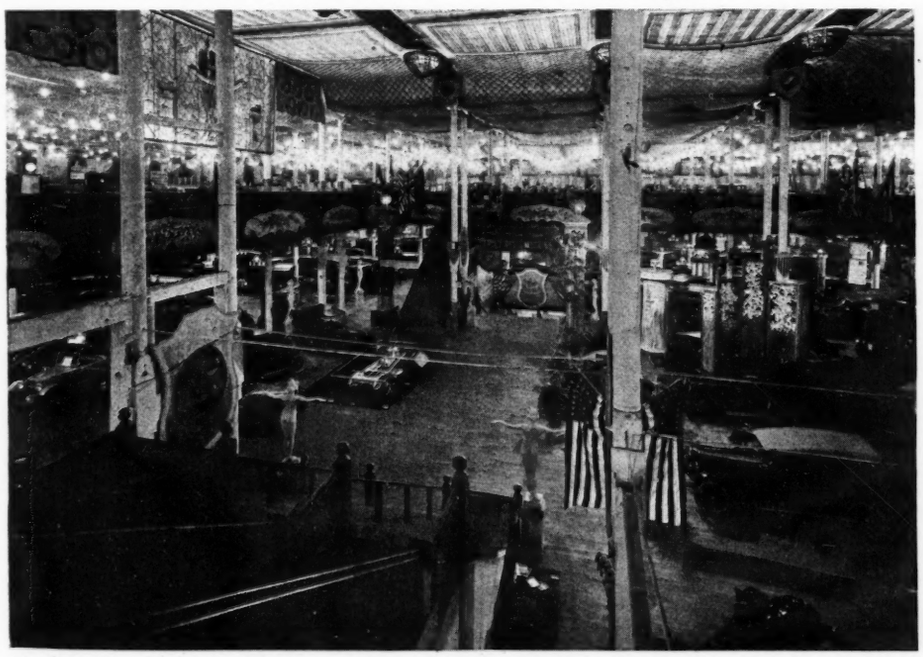
Of course, in talking about the Fordson tractor, there is nothing to talk about except motor car dealers, as the Fordson is marketed exclusively through them. Naturally, however, it follows that not every motor car man is a howling success as a tractor salesman, and J. Glen Roberts of the sales department of the W. H. Schmelzel Co., Inc., St. Paul, Minn., distributer for the Fordson, says the most successful dealer is he who first educates himself, then educates his customer and charges for service. The dealer who gets cold feet on the tractor proposition is he who acquires the old implement idea that he must give all the service in the world free of charge. Mr. Roberts in this brief statement has said a mouthful.

Example of One Concern

One of the concerns which have developed successfully the tractor trade in the Northwest is the LaCrosse Auto Co., distributers of the Happy Farmer tractor. J. E. Williamson, district representative, says the company now has about twenty-five or thirty producing dealers, nine of whom are motor car dealers. All these nine have been unusually successful and are so thoroughly convinced of the possibilities of the tractor trade in the Northwest, there is not the slightest doubt about their continuing in the business.

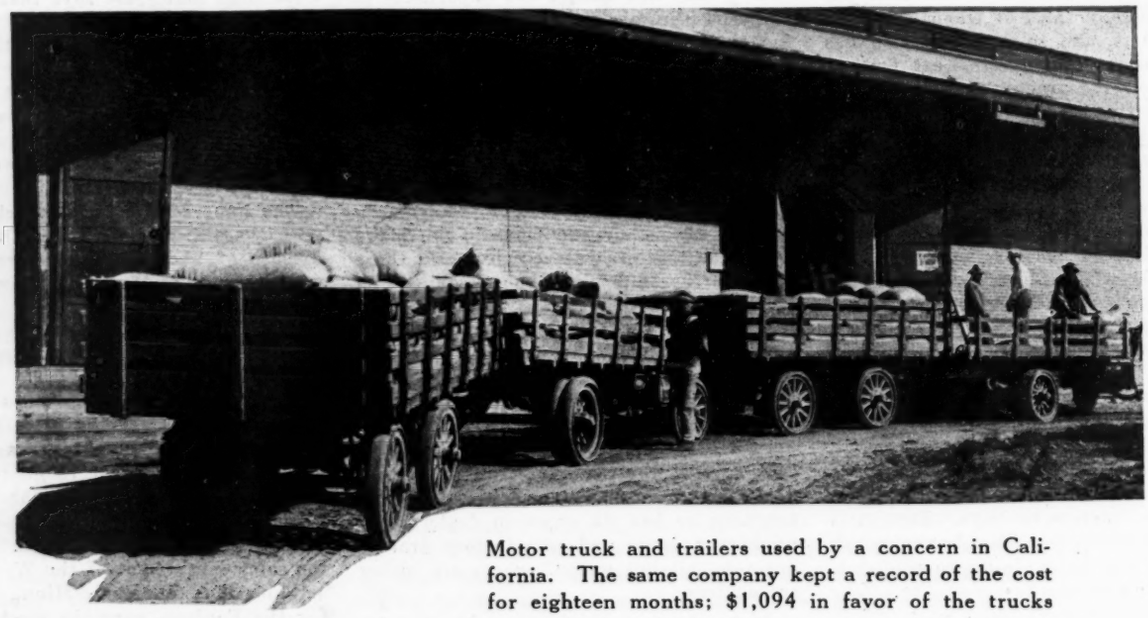
Criticising the motor car dealer as a prospective tractor dealer, he says the attiutde of a good many of them is antagonistic at first. They assume a skeptical attitude. They want to know why tractors are not built like motor cars. They shy a little at the necessary work incurred in selling tractors. They want to handle the tractor along the same kid glove methods that always has pertained in the motor car trade. It is necessary to educate them and sell them on the power farming idea, but the difficult thing is to induce them to come to school. This, according to Mr. Williamson, presents the hardest problem in the tractor trade.

After going pretty deeply into the tractor business of the Northwest and interviewing considerable salesmen and dealers, the conclusion is that for the most part the motor car dealers who have taken on the tractor and have departmentalized their business, who have equipped themselves for service and who have tasted of the fruits of success, are going to remain enthusiastically attached to the tractor trade and will be the big producers of the future.



General view of the passenger car exhibit at the Minneapolis Automotive and Industrial Exposition Feb. 15-22

Roads Plus Trucks Move Crops



Motor truck and trailers used by a concern in California. The same company kept a record of the cost for eighteen months; $1,094 in favor of the trucks

Tons of Rice and Other Produce Carried by Motor Over Good Highways of California

By Robert E. Jones

WE sat on the broad veranda of a pioneer home in the Sacramento Valley, Cal., watching a string of motor trucks, pyramided with bags of rice, pass by bound for the river docks at Colusa. It was last fall. Overhead a squadron of airplanes from Mather field at Sacramento had just flown headed for the old Glenn homestead, domicile of a bonanza wheat farmer of the early days, where a Red Cross fete was to be held in the evening.

"It seems almost unreal—a weird dream," said my companion, the daughter of one of the first settlers. "I can remember when there were no roads and no railroads here, not to mention motor trucks, concrete boulevards and airplanes. During the wheat harvest father used to set off for the river in a buckboard dragging a chain to mark a trail in the grass for the teamsters, with their loads of wheat, to follow. Those wagon trains crept along through that clump of oaks yonder—there were no fences—going to the river in one day and returning the next."

"And now it's motor trucks, almost an army train of them, carrying from 5 to 9 tons of rice at a load, moving swiftly over hard-surfaced roads," I put in.

"We are living in a wonderful generation," she mused.

Good Roads Spur Trucking

Of course it was a trite remark—so because many people have realized the truth of it and voiced it.

Motor truck transportation in California has grown as the state's system of hard-surfaced highways has been extended, and this has been rapidly. Trunk-line roads, connecting the county seats—more than fifty of them—are being built under a $33,000,000 bond issue, and the work is more than 50 per cent completed. Counties have followed the example and are building similar concrete roads to tie up with the state system. The shortest routes between shipping points were selected when the state system was laid out for the sake of through tourist travel and freighting.

A form of rural motor express has existed in California almost since the beginning of motor trucks. It followed closely upon their appearance in cities. But the most recent development has been in crop handling on a large scale. In this service the motor truck has played a tremendous part in getting food under cover before stormy periods of the year, for even California has some wet weather. Rapid transfer from field to warehouse is vital to such crops as rice, beans and hops—growers of these never realized before how much they were losing to the weather. Of course, there has been a saving, too, in cost of moving, but that is a second consideration with them.

Trucks for crop moving first were tried by a community of hop growers in the Sacramento valley where yards are 20 miles

Truck with 9 tons of rice on the scales at Colusa, with a smaller truck waiting to be weighed

from the railroad and the river. A progressive truck man offered to carry their hops to the steamer landing at 35 cents a bale and got the business. Eight-mule teams with three wagons had been carrying these hops, making a trip from the country in 8 to 10 hr., three round trips a week. The trucks made three trips daily, carrying fifty bales each.

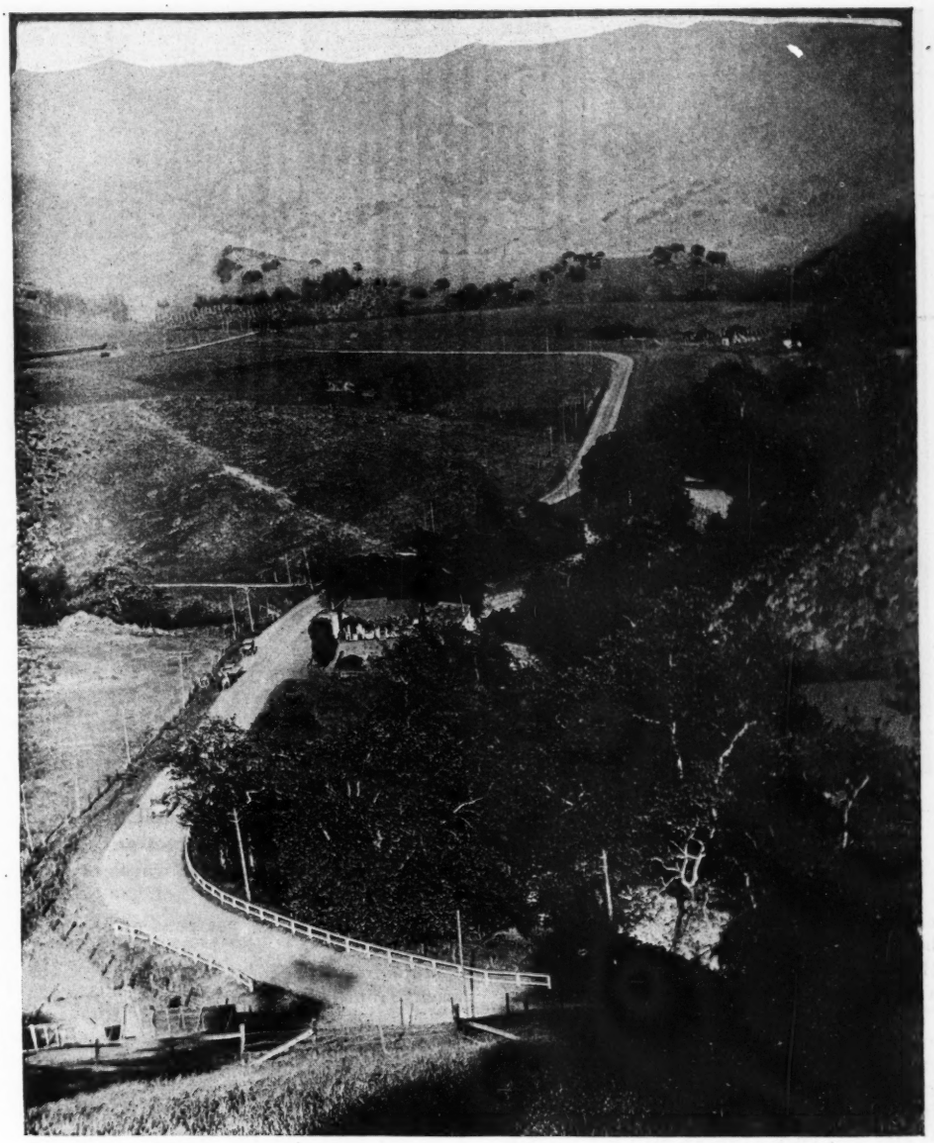
Trucks had not been operating long before a totally unsuspected benefit to the grower appeared, a factor which saved him entirely the cost of the new kind of transportation. In the old days, during the 7- to 8-hr. trips under the boiling sun hops lost weight by evaporation. This shrinkage was reduced by the speed of the motor trucks to such an extent that the first season they were used it was figured the saving in weight per truck load amounted to $35. Since hops were weighed by the buyer at the end of the journey the grower got the benefit of this. Trucks handled hops at $17.50 a load against $20 for the same quantity by mule-team power. In one season growers of this district saved $12,400 by contracting with the motor truck people instead of using mule teams.

Most of the trucking on a large scale is by individual truck owners or companies in the cities which go into the country after the harvest and contract to move the crops. While the summer and fall are busy periods in California it is almost a year-around business.

Vegetables by Truck

Hardy vegetables such as lettuce, celery and spinach begin to move in the early winter to railroad stations for shipment east or to canneries and dehydrating plants. Thousands of truck loads of spinach grown in fields that produce tomatoes in summer are hauled to canneries and drying plants at Sacramento through the winter. A truck with a large flat bed has almost the capacity of a box car, for spinach is light in proportion to its bulk. The plant is stuffed into crates, which are piled high on the truck.

With asparagus and artichokes in the early spring the vegetable season keeps many trucks busy until the first deciduous fruit is ripe. Fruit growers usually are established farmers operating on their own land, and many of them own trucks. But the canneries, obtaining fruit from a distance even up to 50 miles, contract with truck owners for hauling fruit to their plants, for it not only saves in the actual cost of moving, but the boxes are handled



California state highway, such a road that it makes trucking on a large scale possible and practicable

Record of Truck Performance Kept by Kern County Land Co.

Month—	Total miles	Tons hauled	Gasoline	Oil	Repairs	Tires	Driver	Total cost	Ton miles	Cost per mile	Cost ton, mile	Earnings
January	1,342	329	$57.00	$25.40	$27.20	$70.00	$105.00	$284.60	4,957	$ .212	$ .057	$331.00
February	901	336	38.10	16.00	36.95	70.00	110.00	271.05	2,608	.301	.104	244.50
March	1,804	213½	70.00	25.80	271.65	35.00	130.00	532.45	4,964	.295	.107	384.00
April	1,307	168	46.00	22.00	13.82	.....	120.00	201.82	2,888	.154	.077	324.50
May	1,178	339½	51.60	25.80	14.45	.....	105.00	196.85	5,301	.167	.035	280.00
June	1,118	384½	39.40	18.00	96.04	.....	115.00	268.44	4,874	.24	.055	326.25
July	2,077	918	54.60	38.80	47.81	85.25	152.50	378.96	11,128	.187	.033	431.45
August	1,867	627¼	54.10	28.00	90.56	.....	125.00	297.66	8,876	.159	.033	437.00
September	2,026	495¼	63.00	32.80	34.97	106.92	117.50	248.27	10,412	.123	.024	383.00
October	556	370½	18.30	9.30	89.70	92.00	110.00	227.30	2,001	.407	.113	186.05
November	1,200	264½	45.70	20.10	23.50	.....	120.00	209.30	4,975	.174	.042	350.50
December	1,096	406½	41.90	19.00	171.02	.....	117.50	456.34	5,857	.405	.077	383.86
January	1,586	542½	64.50	22.00	87.95	.....	133.33	399.78	7,714	.252	.051	424.63
February	669	157½	30.10	11.00	63.10	.....	128.00	232.20	1,605	.347	.145	200.87
March	799	648	35.60	12.50	11.01	.....	131.00	190.11	3,370	.243	.056	310.68
April	1,003	268½	46.20	14.40	3.80	.....	136.20	200.60	4,375	.20	.045	364.77
May	1,020	351½	25.80	13.00	7.89	.....	132.33	179.02	4,080	.176	.043	370.26
June	905	252	45.50	14.40	40.87	.....	152.64	253.41	2,952	.26	.089	388.28
	22,454	7,102½	$827.40	$368.30	$1,132.29	$459.17	$2,241.00	$5,028.16	93,337	$4.302	$1.186	$6,121.60
									Average	.224	.0539	

Balance in favor of truck, $1,094.44.

A truck on the Moreing brothers' ranch loaded with wheat in the bulk. The load has just been discharged from the bin on the side of the harvester, and the driver is smoothing out the top of his load before starting for the warehouse

only twice. If shipped by rail, boxes would be handled four times. Everyone knows that handling costs more than moving for a short haul.

The fruit season lasts through summer and winds up about Nov. 15, so that a large extra force of trucks is necessary when grain ripens. While wheat and barley farmers have not taken to trucks as readily as rice and bean growers, still the truck is handling a great deal of these cereals, particularly for large operators.

Manager H. A. Jastro of the Kern County Land Co. at Bakersfield, learned that he could handle wheat from a 20,000-acre field 18 to 20 miles from the company's warehouse in town at 50 per cent of the railroad rate.

Mule-drawn wagons carried the sacked wheat from field to the state highway and piled it beside the road, where the automatic loader was used to lift bags onto trucks. Eight 3-ton trucks with 3-ton trailers have been used for several years. Trucks carried an average load of from 5 to 5½ tons and the trailers, from 5½ to 6 tons. Careful account of the cost of operating these trucks and trailers has been kept, and a table showing the expense account of one outfit and its earnings over a period of eighteen months is reproduced herewith.

The railroad rate was 9 cents a 100 lb. from the station adjoining the ranch to the warehouse, or $1.80 a ton, plus 15 cents a ton for switching and 6 cents a ton war tax, or a total of $2.01. Trucks with trailers delivered the wheat at 83 cents a ton, or 4 cents a 100 lb. They made two trips daily and last season transported 300,000 bags of wheat. The daily charge for a truck was $12.50 and for the combination of truck and trailer, $15.

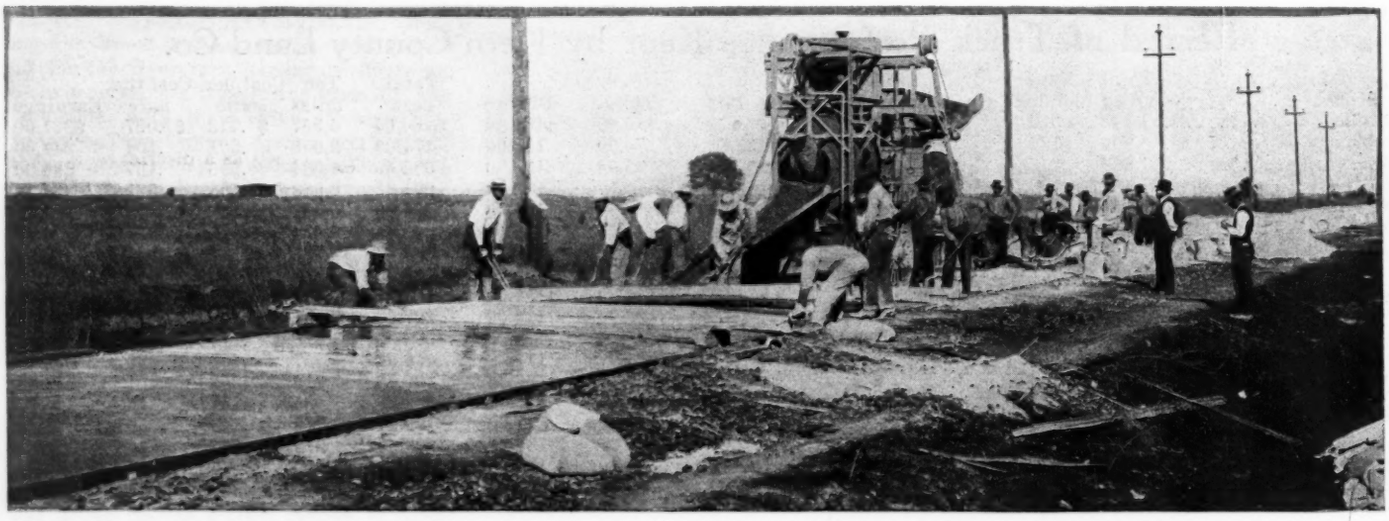
While most of the wheat in California still is handled in bags, some of the larger and more progressive growers are turning to bulk handling. This is the method used on the Moreing Brothers' farm of 23,000 acres near Sacramento. Two years ago they were using forty-five wagons with four-mule teams and forty-five drivers to haul wheat from their harvesters to the bins on the Sacramento river levee, whence grain was loaded by gravity onto barges. Foreseeing a troublesome labor season they bought seven 3-ton trucks and thereby reduced their force of men by more than forty, for the teamster crew had required an additional cook and the mules, three stable boys. Teamsters had been getting $3 a day and board, and it was difficult to keep the force together. The seven truck drivers were paid $5 a day and board and remained throughout the season.

General Foreman C. M. Owen had not checked up the difference in cost of transportation when I talked to him but was satisfied to stay with the trucks.

"I don't know how we would have got through the season if it had been necessary to hire forty-five teamsters," he said. "Besides I find that while the wagons carried 3 tons at a load and made 2 m.p.h., the trucks carried 5 tons at a load and made 12 to 15 m.p.h. The wagons made from two to three trips daily, while the trucks made seven."

Special Truck Bodies Used

These trucks have been equipped with special bodies of tongue and groove material for bulk wheat. They are loaded from a 5-ton bin on the side of the thresher in the field in 3 min., and the load is discharged even more quickly at the other end. The truck is driven onto a wooden

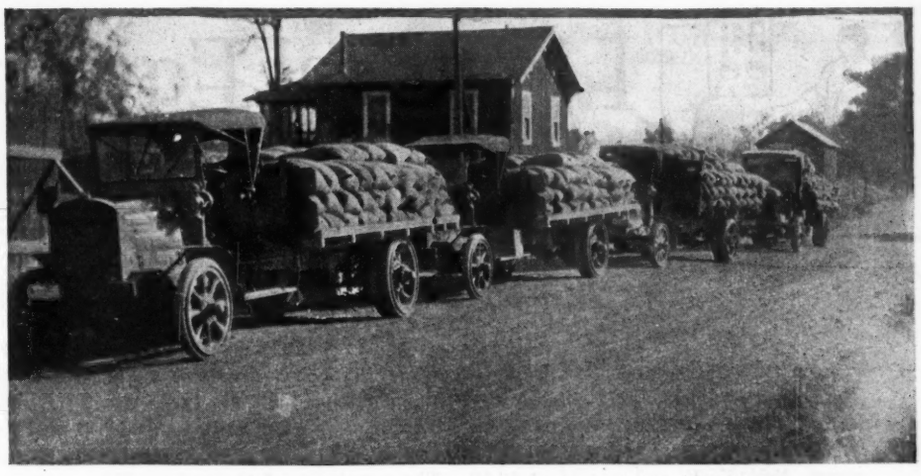


Building a unit of the California state highway. If the weight of the crops transported by truck becomes too heavy, it will be possible to put another slab on top of the present 5 inches of concrete

grating of 2-by-12-in. planks placed on edge over the hopper with the front wheels up an incline of 30 deg. and the rear wheels resting over the top of the hopper. The end gate at the lower edge of the truck bed then is opened and the wheat runs out.

Busy days for the contract trucks come when the sugar beets are ready for digging and the beans and rice turn yellow. The sugar factory's "sphere of influence" on farming has widened tremendously since trucks have come into use. Formerly most of the beets were grown on land within a few miles of the factory but now, thanks to the truck, they can be produced at a profit many miles away.

Rice is a comparatively new crop in California and, with beans, ripens late in the fall. The quantity of both has increased so greatly in a few years that the transportation problem has been multipled. In fact, the first rice grown in the Sacramento valley was planted in 1908, and for 1918 the crop is valued at $15,000,000. The bean crop for 1918 is valued at about $50,000,000.



Motor trucks loaded with grain waiting to get to the doors of the river warehouse at Princeton, Cal.

Truck Prevents Rice Loss

The main problem of both rice and bean men is to avoid the early fall rains. They may grow a wonderful crop, but if the rain comes while sacks are piled in the field, losses may mount to thousands of dollars in a single night. Accordingly the truck has fitted profitably into the scheme of operations on bean and rice farms. Both of these crops are motor machine planted and cultivated, and trucks for quick moving complete the motorized equipment.

I visited Colusa, in the center of a rice district, this fall, and fifty trucks were operating through that town, from the rice fields beyond to warehouses on the river levee. While the trucks on the land and big barges in the river form an admirable combination for moving the quantity of rice, the total yield has become so large that all rail lines get their share of the through business. Trucks do not venture onto the wet and boggy rice fields but pick up their loads along the concrete roads where the bags have been piled from wagons.

In the Colusa district all sorts of machines were pressed into service, from the made-over light touring car to 7-ton trucks. One machine was carrying 180 bags, more than 9 tons, and it tipped the scales at 28,740 lb., the figures, of course, including the weight of the truck as well as its load.

Beans are handled in similar fashion, though most of the bean fields are nearer the river and the haul is shorter. Trucks can go directly into the bean fields, where the soil is on a more solid foundation.

All railroad expansion in California now takes the motor truck as a crop mover into consideration. One electric line in the Sacramento valley is in the curious position of fostering the building of a hard-surface road, for it would make a certain large producing district tributary to its line by motor truck transportation.

Manager George Maddock of the great Armour project involving 70,000 acres of rich, river-bottom land in the Sutter basin is planning on a gridiron of concrete roads for motor trucks to carry vegetables to canneries and dehydrating plants.

Thus far the standard state highway seems to be standing up under this heavy transportation, but State Highway Engineer Austin B. Fletcher is watching the situation closely to see if any change in specifications may be necessary. If the weight becomes too heavy it will be possible to put another slab on top of the present 5 in. of concrete.

This motor truck is loaded with 9 tons of rice and is shown climbing the levee grade at Colusa

WAYNE CHANGES IN STAFF

Fort Wayne, Ind., Feb. 21—E. J. Gallmeyer, formerly manager of the Memphis district, assumed the general sales managership of the Wayne Oil Tank & Pump Co. Jan. 1. He succeeds B. F. Geyers, who was promoted to the office of vice-president and general manager. Memphis will cease to exist as a district office, although a sales office will be maintained at the old location.

Part of the Memphis district is taken over by Jay P. Hackenberg at Kansas City, Mo. Robert E. Fleming will move his headquarters from Richmond, Va., to Atlanta, Ga., and F. O. Sallee will be in charge of the Richmond district office. The office at Wichita, Kan., is discontinued and one is opened at Dallas, Tex., with J. Milton Tucker in charge. C. F. Leland, formerly in charge of the Chicago branch will direct the Minneapolis office. Chicago will be discontinued as a district office and only a salesroom kept. A. W. Clark, at Boston for several years, assumes charge of the Denver division. D. W. McConnell, formerly at Denver, will direct a new district created with Detroit as center.

STUTZ PROFITS DROP

Indianapolis, Ind., Feb. 21—The Stutz Motor Car Co. of America, Inc., for the year ended Dec. 21, 1918, shows net profits of $594,047 as against $1,074,778 for 1917, a decrease of $484,731 for the year. Gross profits decreased $462,615, from $1,107,334 in 1917 to $644,719 in 1918, and net sales decreased $946,758, a drop from $4,483,315 in 1917 to $3,536,557 in 1918.

Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the 135th installment of a weekly series of articles begun in MOTOR AGE, *issue of June 29, 1916, designed to give the repairman and motorist the knowledge which will enable them to care for and repair any and all of the electrical features of the car, no matter what make or model it may be.*

The first half of this series has been published in book form by the U. P. C. Book Co., Inc., 243-249 West Thirty-ninth street, New York, and is sold at $2.50. The remainder of the series will be published as a supplementary volume.

Part CXXXV—Remy Electrical Systems

REMY installations may be made up of separate units for lighting, starting and ignition or these various units may be combined in different ways, all depending upon the particular installation. All the different systems employing a separate generator and motor are of the 6-volt type and may be either single or two-wire. All the motors are four-pole series-wound. The frames of the machines are rectangular or round, depending upon the model.

A double-deck system manufactured by the Remy Electric Co. consists of a separate generator driven by a shaft extending from the timing gear case and a separate motor mounted directly above it. The generator element is a two-pole machine, and the motor element is a four-pole series wound motor. The motor is connected to the engine crankshaft by two pairs of spur reduction gears. An overrunning clutch is mounted in the large gear on the main shaft, and this clutch runs free when the engine is running under its own power.

A combined generator and motor unit having a single armature was used on the 1913 Premier motor car. This unit is of the 12-volt type, and in some cases an interrupter and distributer may be added, thus combining the starting, lighting and ignition functions all in one machine. The armature of this machine was connected directly to the engine crankshaft without any overrunning clutch or similar device, as the armature rotates all the time the engine is in operation.

A Remy generator with a magneto type of breaker box mounted on one end an a distributer directly above it is shown in Fig. 684. This generator is a 6-volt two-pole shunt-wound machine, and its output is regulated by the third-brush method. Another type of Remy generator is shown in Fig. 685.

The most recent type of Remy generator is a 6-volt, two-pole machine whose output is regulated by the third-brush method in combination with a special thermostatic control, which will be described in detail in one of the following sections. Two types of Remy starting motors are shown in Figs. 686 and 687.

Regulating Output of Generators

Four different methods are employed by the Remy company in regulating the output of their generators, and these methods are:

Third-brush regulation.
Electromagnetic regulation.
Reversed series field regulation.
Combination of third-brush and thermostatic regulation.

The third-brush method of regulating the output of the generators is used on many different models of Remy generators, such as the rectangular generators with or without ignition heads and the double deck rectangular frame generator and motor.

The electromagnetic regulation consists of an electromagnet, usually carried in the same housing as the cutout. This electromagnet operates so as to intermittently insert a resistance in the field circuit of the generator as the current output of the generator increases. Several different types of regulators have been in use, but they all operate on the same principle.

One type of regulator has the cutout and regulator electromagnets mounted in a horizontal position, while in another type they are mounted in a vertical position. The operation and adjustment of both types is practically the same. Some of the more recent regulators are so constructed that the current taken by

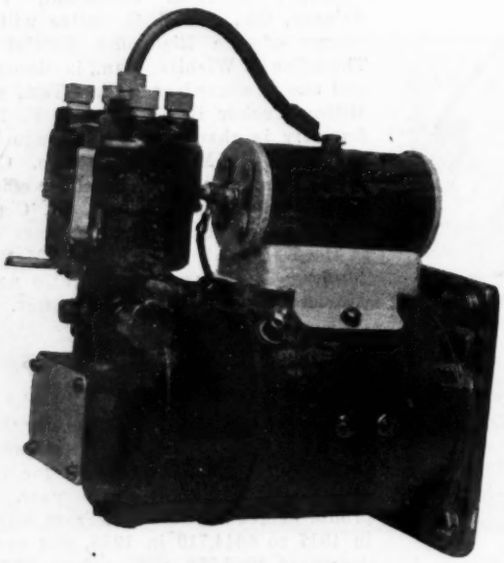


Fig 684—Remy ignition generator with third-brush regulation

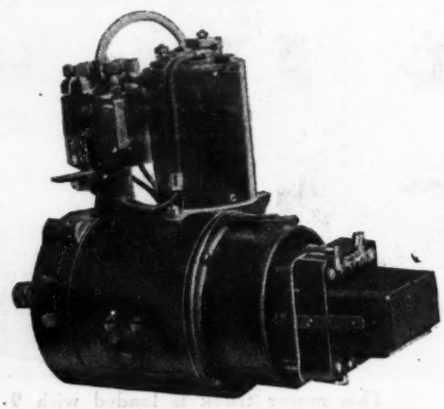


Fig. 685—Remy ignition generator with electromagnetic regulation

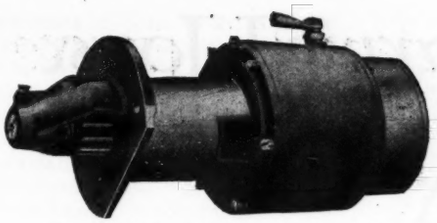


Fig. 686—Remy starting motor model 180

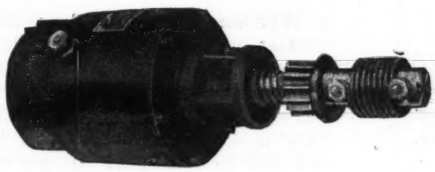


Fig. 687—Remy starting motor model 114

the lamps does not pass through the entire regulator winding, so that when the lamps are turned on the strength of the electromagnet of the regulator in relation to the output is decreased and the generator output thus is increased to take care of the additional lamp load.

The generator used on the 1913 Premier motor car was a two-hole compound wound machine with the series field winding connected in such a way that its magnetizing action was opposed to the magnetizing action of the shunt field winding. The connections of the lamp circuits is such that when current is being supplied to the lamps it passes through only a part of the series winding, which causes the generator to have a greater output than it would have if all the current were going to the storage battery.

Combined Third-Brush and Thermostatic Regulation

The main regulation of the generator is taken care of by the third-brush method. A specially constructed thermostat is mounted inside the generator housing. A resistance coil is connected across the contacts of this thermostat, and the contacts normally are closed. The terminals of the thermostat are connected directly in series with the shunt field winding of the generator, and when the contacts of the thermostat are open the resistance is connected in series with the field winding. The adjustment of the thermostat contacts is such that when the temperature of the generator has reached an approximate predetermined value the resistance is introduced in the field circuit and the generator output lowered. Two curves showing the relation between output of the generator in amperes and speed, with and without the resistance in circuit, are given in Fig. 688. The chief advantages of this device are that it gives a larger generator output in cold weather when the efficiency of the battery is lower than in warm weather and also a larger output when the car is being driven intermittently and the demands on the battery are greater, due to the frequent use of the starting motor.

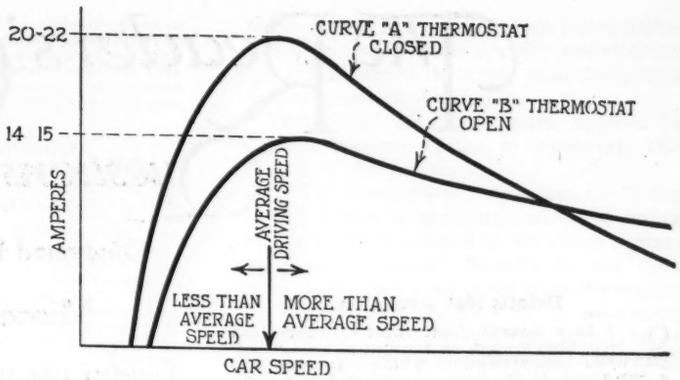


Fig. 688—Curves showing relation between car speed and generator current with thermostat contact points closed and open on Remy generator

The cutouts are of the electromagnetic type, with a shunt and series winding. The construction of the generators is such that cutout closes at a rather low speed in miles per hour. The combined cutout and regulator may be mounted on the generator or as a separate unit on the dash or some better location.

Starting Motors, Drives and Switches

The separate starting motors are four-pole series-wound machines, and may be connected to the engine crankshaft by a reduction gearing and overruning clutch, by a special chain drive and ratchet, as used on the Reo car or by the Bendix drive. In the case of the combined generator and motor unit no overrunning clutch of any kind is used, but there is a definite connection between the armature of the electric unit and the crankshaft of the engine.

Two general types of starting switches are used. One of these is the tapered plunger type, in which the two contacts are connected together by depressing a plunger or pulling or pushing a rod. The other type uses copper bands, which slide on cylinders of insulating material. Contact bands are mounted on the cylinders in such a position that the sliding rings couple the circuit between the contact bands when fully depressed.

Two types of battery ignition systems are made by the Remy company, the grounded and the insulated. In the grounded ignition system, such as on the Chalmers model 35, the primary winding of the ignition coil is grounded, as is also the circuit breaker arm. In the insulated ignition system, such as that used on the Reo, Velie and McLaughlin motor cars, the circuit breaker is connected directly across the primary winding of the ignition coil, no ground being used. In the grounded ignition system the coil base is used for grounding the primary winding, and in both systems the base is used for grounding one end of the secondary winding. Therefore, it is necessary that the base of coil should be clean and should make good contact.

A condenser connected in shunt with the breaker contacts on all systems, the object being to reduce arcing at contacts and raise the efficiency of the coil.

MOLINE-KNIGHT PRICES

East Moline, Ill., Feb. 21—Moline-Knight dealers are being notified by the Root & Van Dervoort Engineering Co., maker of the car, that there will be no drop in prices this year. Dealers are guaranteed refunds for their customers of any reduction that might be made before Jan. 1, 1920.

WILSON SEES GREAT YEAR

Detroit, Feb. 21—The C. R. Wilson Body Co. estimates that its total sales for 1919 will exceed $6,000,000. The company's business for January exceeds $600,000. New business already on the books calls for the 1919 delivery of 63,000 bodies. The company is making bodies for Ford, Paige, Hupp, Liberty, Oakland, Reo, Saxon and Willys-Overland.

SIXTY CADILLACS DAILY

Detroit, Feb. 21—Cadillac has run its production up to sixty cars daily and anticipates producing between ninety and 100 machines shortly. The 1919 production schedule has not been announced, but it probably will equal that of 1918, which called for 18,000 cars.

OVERLAND SPEEDING UP

Toledo, Ohio, Feb. 21—The Willys-Overland Co. will be turning out 400 cars daily by March 1. The factory is now making 350 cars a day and the number of employees has been increased from 10,000 during December and part of January to 12,000.

The John N. Willys Export Co. has been incorporated in Delaware with a capital of $100,000 by John N. Willys. A. C. Morse, former vice-president of the Chalmers, is i . charge of the new organization and will direct all export work.

The Readers' Clearing House

Questions and Answers

Conducted by B. M. Ikert

Details Not Available

Q—I have several Continental cylinders that have been scored on account of loose wristpins whose lockscrews were falling out. Some have a cut about ⅛ in. deep. Recently I saw some of these cuts soldered with white metal or babbitt metal with good results. A special soldering iron, three different kinds of acids and a piece of sheet metal or galvanized iron cut half round to fit the cylinder bore to use like a scraper was all that was used for the purpose. What kind of acids were used? What kind of metal, white metal or babbitt metal? What kind of a soldering iron? What kind of a blow torch? Where is this outfit for sale? Give instructions to fill wristpin scores.—John Arendsen, New Orleans, La.

The process is a secret one, and patents are controlled by L. Lawrence & Co., Chicago.

Concerning Doble

Q—Who manufactures the Doble steamers?
2—How many cars have they made to date?
3—What is the output of their factory per day?
4—Give the price, wheelbase and weight of their seven-passenger car.
5—What did this concern manufacture during the war?
6—Publish picture of their seven-passenger car.—Edward Gerhold, St. Louis, Mo.

1—Doble Detroit Co. of Detroit.

2—A very few, only a few for exhibition.

3—This is not known.

4—The price, $3,750; wheelbase, 128 in.; weight, 3500 lbs.

5—Boilers of a small type for patrol boats.

6—The Doble is shown in Fig. 2.

Engine Lacks Power

Q—What would cause a decided lack of power and pickup in my White 6-60 seven-passenger car?
2—Is the Rayfield carbureter used successfully on this car?
3—If so, what model would you recommend?
4—What is the highest speed attainable in this car?—R. F. McCain, Lincoln, Neb.

1—Any one of several things will cause a lack of power. Poor compression, leaky valves, scored cylinders, irregular sparking, poor carburetion. We would advise having car looked over or tell us more definitely of the symptoms.

2—Yes.

Miscellaneous

3—Better take this up with the maker, giving full details of your engine condition.

4—We know of no official records.

Adjusting Stewart Clutch

Q—Show adjustment of clutch on 1917 ¾-ton Stewart truck.—C. O. McDonald, Norfolk, Va.

Two types of transmission and clutches were used on the 1917 Stewart trucks. The type used in the older models is known as the Detroit and in the later models the Mechanics, both being of the dry-disk type.

There is no adjustment on this clutch, and if the lining happens to be burned out, there is no remedy except to supply a new lining, which comes with the disks. What may be called an adjustment is to see that the clutch lever is free; that is, that it has at least an inch of play before feeling the spring engagement. If this is looked to after the first 150 miles of running, little trouble will ensue. It is a matter for inspection once in a while.

This adjustment is accomplished by loosening the bolt which holds the dog and then adjusting by moving the pedal forward so it has an inch of play, after which it should be tightened. If the clutch is not adjusted to have this play, it will slip and wear and burn out the fabric lining. Slipping a clutch for a very few minutes practically will ruin it.

Lowering Ford Frame

Q—How can a Ford be underslung?—John Fleming, Connersville, Ind.

This is shown in Fig. 1. Do not attempt to undersling the Ford chassis but follow the method outlined and you will meet with success. Several Fords have been rebuilt in this fashion and the results are highly satisfactory. It requires making several brackets, but any blacksmith can make them up for you. The cost in one case was $2.50.

The hardest part will be at the rear. The frame must be cut where it joins the rear spring saddle, or cross member. For this you need a cold chisel, hammer and hacksaw. Cut off the heads of all the rivets and in some instances it will be necessary to drill the rivet partly to get it out. After you have the gusset or triangular plate removed make a cut right through the frame, as shown by the dotted line. While doing this have something under the rear axle for a support.

The front brackets are made of ½-in. steel 2 in. wide, shaped as shown. The other dimensions are governed by whatever amount the frame is to be dropped. The brackets fit over the front axle, being held in place by bolts passing through the same holes formerly occupied by the spring perches. The latter are cut off and threaded for a nut to hold them in the hole. Thus, you see the front cross member of frame and spring are not disturbed, nor need the radius rods be lengthened. It increases the wheelbase slightly. You can give the front axle a greater tilt by putting a small bend in the part of the bracket holding the spring perch. You also will have to do away with the spring link oilers, as they will interfere with the tie rod when the wheels are locked on a sharp turn. Close up the holes in the links with grease and drill a small oil hole in the top of the spring perch. The present Ford spring is equipped with an oil hole in the end that fastens to the link, so you will be fixed all right on this point. While working on the front axle, support the frame with a saw horse on each side. This takes the weight off the spring and it is much easier to do the job.

When you have cut the rear part of the frame and drilled the holes in the brackets, clamp the latter in place with steel clamps in the position they are to occupy. Then you can spot the holes in the frame with a punch, so they can be drilled. The

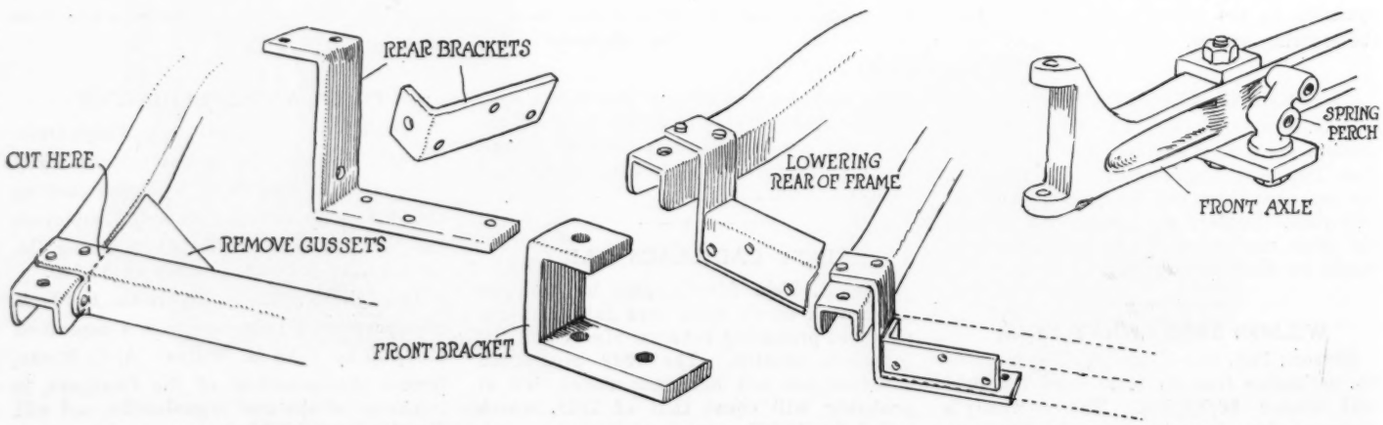


Fig. 1—Lowering Ford frame. The brackets can be made by a blacksmith. The rear spring cross member must be cut off on the dots

brackets are made of ⅜-in. steel the width of the frame. The smaller piece to go on the inside is made of $\frac{3}{16}$-in. material and has a 90-deg. bend at one end. All the holes should be ¼ in. In all there will be six holes in each of the main brackets and four in the small one. Get ½ lb. of ¼ by ¾-in. round head rivets. If you have a portable forge handy, it will facilitate the riveting, as the frame must be hot-riveted. It is also a two-man job, one to hold a hammer against the head of the rivet while the other manipulates the riveting hammer. In the absence of a forge a good brazing torch can be used.

When the job is complete the radius rods must be altered somewhat, as the latter will strike the frame, having only an inch or so clearance. To lower the radius rods bolt a piece of steel to the axle flange using the holes formerly occupied by the radius rods. Then bolt the latter to this. Some sort of bracket will have to be made for the rods at the forward end also to lower them slightly.

Reader Theoretically Inclined

Q—Give definition of the following: Mean effective pressure, compression ratio, propeller efficiency, number of cubic feet of mixture an engine can handle, super-compression, supercharging, theoretical maximum.

2—Explain principles of the Stanley steamer and Doble-Detroit cars?

3—What is the voltage and amperage delivered to the spark plug of the average engine at the moment of fire? What is the temperature in a gas engine?—John Werner, Chicago.

1—Mean effective pressure is the average pressure within the cylinder during the power stroke. In gas engines this is assumed to be about 90 lb. In the determination of the N. A. C. C. formula:

$$\text{Horsepower} = \frac{D^2 \times N}{2.5}$$

the mean effective pressure assumed was 90 lb. The M.E.P., as it is called, is determined with an indicator, a device that gives an area on a card whose dimensions are exactly proportional to the length of the stroke and the pressure within the cylinder at all positions of the stroke. The area of this car divided by the length of the card will give the average height, and this multiplied by the scale of the spring on the indicator will give the mean effective pressure.

Compression ratio is the ratio of the maximum compression pressure to atmospheric pressure. Thus if the compression pressure amounts to 55 lb. the ratio is 55÷14.7 or 3.74.

Propeller efficiency is determined from the two factors that represent propeller operation. One is dependent upon an assumption of the ideal. If a propeller were operating in an atmosphere that had no elasticity, the operation would correspond very much to operation of a screw in a nut, that is, every revolution would be represented by a movement in the direction of the screw, an amount equal to the pitch of the screw. Practically, this is not the case. A propeller has a certain amount of slip, and the distance the propeller actually advances divided by the amount it would advance under ideal conditions would be the propeller efficiency.

Super-compression engines generally are referred to as those whose ignition is dependent upon the heat of compression. This heat can be had only by super-compressing the charge.

Super-charging has been applied to a few engines that tried to take into the cylinder a charge whose volume under atmospheric conditions would be larger than the piston displacement of the engine.

Theoretical maximum when applied to gaseous mixture means a volumetric efficiency of 100 per cent.

2—The principle of any steam car is the same. Steam is generated within a boiler and from there is piped to the steam engine, which is connected directly to the rear axle. The steam then is led from the engine to the condenser. Here it is condensed and, after it is changed into water, it is led back to the feed water tank. The feed water pump then pumps the water back to boiler in the quantity the regulator permits.

3—The voltage of the spark is close to 15,000 and the amperage, very small, about 0.000004. The temperature at the time of explosion is around 4000 deg., but this rapidly cools and is less than 1000 at the time of exhaust.

Protecting Car Finish

Q—What can be put on a new car for driving from the factory so as to prevent the finish from being marred by mud stains, etc.—R. D. Fowler, Canfield, Ohio.

Any of the good wax polishes are recommended for this.

Weight of Cadillac

Q—What is the weight of a Cadillac 57 four-passenger car?—E. A. Hamilton, San Jose, Cal.

paratus the wires connect? For instance, mation. Conditions vary so that the weights of cars of one make even will vary to some extent.

Shock Absorber for Dodge

Q—What shock absorber would be best for the Dodge Brothers car?—E. J. Becker, Millville, Minn.

The maker of the Dodge Brothers car advises that the owners wishing to install shock absorbers can determine from experience alone the type of absorber best suited to their requirements.

Difference in Ford Models

Q—Is there a difference in the early and late models in regard to the size and position of coils and magnets?—E. S. Palmatier, Fresno, Cal.

Yes, there is some difference. The coils used to be round, whereas now they are oblong in shape, with oblong pole pieces, so that as soon as the magnets pass away from one pole they begin to influence the next. Thus there are no dead points. There were dead points on the older models, which did not have ¾-in. magnets; on the later magnetos as the magnets pass from one end to the other as it revolves there is no dead point.

Adjusting Ford Gearset

Q—Please explain all the adjustments of the Ford gearset and clutch.—W. E. Thragnorton, Ingram, Ark.

To adjust the slow speed, remove floorboards, and with a wrench of the proper size loosen the locknut on right side of gearcase. The adjusting screw can be screwed clockwise, thereby tightening the slow speed band. The band can be tightened up to that point where it will be just loose enough to prevent binding on the slow-speed drum. This point can be determined by tightening the band a turn or two at the time. Between each process of tightening, crank the engine so that when the band has been tightened so much

TO assist readers in obtaining as a unit all information contained in this department on a certain subject MOTOR AGE segregates inquiries into divisions of allied nature. Questions pertaining to engines are answered under that head, and so on.

MISCELLANEOUS

John Arendsen.....New Orleans, La.
Edward Gerhold.....St. Louis, Mo.
R. F. McCain.....Lincoln, Neb.
C. O. McDonald.....Norfolk, Va.
John Fleming.....Connersville, Ind.
John Werner.....Chicago
R. D. Fowler.....Canfield, Ohio
E. A. Hamilton.....San Jose, Cal.
E. J. Becker.....Millville, Minn.
E. S. Palmatier.....Fresno, Cal.
W. E. Thragnorton.....Ingram, Ark.
Morris Ferguson..Salt Lake City, Utah
J. J. Allen.....Chicago

CARBURETION

B. M. Sain.....Pittsburgh, Pa.
L. Grant.....Albuquerque, N. M.
J. H. E.....St. Louis, Mo.
M. R. Donovan, Jr.....Bernard, Iowa
Herman Meyzig.....Berlin, Wis.

ENGINES

Ralph Beers.....Detroit
W. L. Brown.....McPherson, Kan.
Paul Ward.....West Middleton, Ohio
George F. Noisom..Battle Creek, Mich.
Guillermo Olhoa.....Mexico
A. P. Herff.....San Antonio, Tex.
R. H. Schatz.....Minot, N. D.
Guy Weese.....Frankford, Ont.

THE ELECTRIC SYSTEM

Carl Thorden.....Buffalo, N. Y.
V. Steinborn.....Chicago
F. W. Lesmeister.....Selz, N. D.
J. H. Wyle.....Dix, Neb.
Charles H. Allen.....La Rue, Ohio
M. A. Barbier.....New Orleans, La.
Dick Davis.....Los Angeles, Cal.
Ray Shinn.....Keokuk, Iowa
H. F. Murray.....Geddes, S. D.
W. D. Benghardt.Whitney Point, N. Y.
Mark F. Grady.....Browning, Mont.

REBUILDING

Ray Weisenmayer.....
.....Fort Leavenworth, Kan.
D. C. Williams.....Detroit
Otto Delfs.....Inman, Kan.
Chester E. Hueman.....Seattle, Wash.
W. M. Bramhall.....Paris, Tex.
M. W. Glazier.....Madison, Wis.

No communication without the writer's name and address will be answered in these columns.

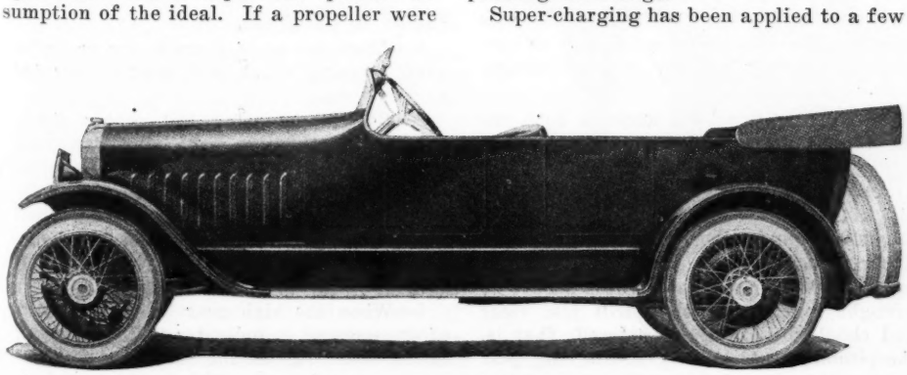


Fig. 2—Side view of the Doble steam car

it binds on the drum it will be noticed by a slight stiffness in the cranking operation. When this point has been reached turn the adjusting screw back a little at the time until the engine will crank freely. Then tighten locknut.

To adjust the transmission reverse speed or brake drum the transmission sloping door must be removed. The reverse band may be adjusted the same as the slow-speed. Adjustment of the brake drum is somewhat different, as the brake drum does not revolve when cranking the engine unless the clutch be engaged. Place a jack under one of the rear wheels and raise it from the ground. Then throw the high speed lever forward, thereby engaging the clutch. When the engine is cranked the brake drum revolves with the driveshaft and adjustment of this band can be accomplished in the same manner as that of the slow-speed and reverse bands.

If a high-speed adjustment is required, this can be done while adjusting the bands as the sloping door must be removed. Directly to the back of the brake drum and screwed to it is the driving plate, which supports three adjusting fingers equidistant from each other. These fingers, through their adjusting screws, have a direct bearing on the disk clutch ring, which is in direct contact and inclosed with the clutch disks. The amount of adjustment these fingers will require depends on how much the clutch slips when the car is in operation. Generally a half turn of the adjusting screw will be sufficient if slipping is noticed in throwing the mechanism in high or on heavy pulls, but it is hardly ever necessary to give the screws more than a full turn. At any rate try half a turn first and if this has not remedied the trouble, another half turn can be given. Extreme care must be exercised in removing the adjusting screw cotter keys so as not to drop one of them in the gearcase in which event it will undoubtedly be picked up by the magnets and lodged between the contact plug and the magneto coil. This will cause a short-circuit and stop the car by cutting off the current leading to the coil box switch.

Various Maxwell Questions

Q—Can I buy a thermostat for the cooling system on a Maxwell 25? Where can I get it and how much will it cost?

2—Can I buy aluminum pistons for this machine? What would these cost?

3—What would cause a grinding noise in the rear axle? It is only heard in from 14 to 20 m. p. h. How can I remedy this?

4—The gears on this machine will not stay in intermediate or low when on a hard pull and I have to hold them in. Can I remedy this myself?—Morris Ferguson, Salt Lake City, Utah.

1—Thermostats are not made for use in connection with thermosyphon cooling systems, rather where a pump is incorporated, because they control the amount of water sent through the system by the pump. The thermosyphon system works best when it has free circulation and when the system is completely filled. Many owners dislike this system in the winter because it tends to freeze, but this is not so much the fault of the system as the carelessness of the owner or operator. There are two prime essentials to remember in using this system. One is always to have the radiator completely filled, otherwise the water can-

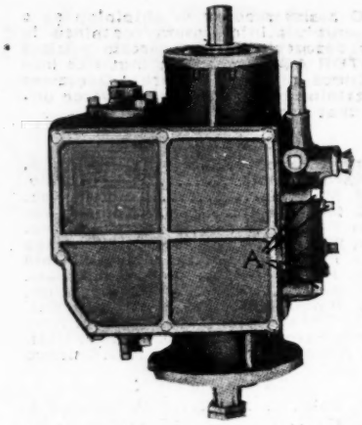


Fig. 3—General view of transmission, showing point of adjustment

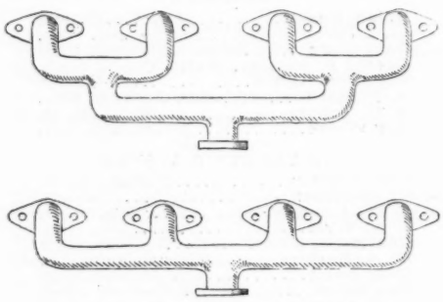


Fig. 4—Two types of manifold

not circulate; the other is to have the water warm before going out into the cold, where the wind can strike the radiator. Until the water is warm it cannot circulate, and if the car is run out before the water is warm it will freeze. A good practice is to blanket the radiator and run the car for a mile or perhaps a little more, depending upon the temperature. Then remove the cover. The water will be nicely warmed and no matter how cold the weather the water will circulate.

2—The Maxwell does not use aluminum alloy pistons and, as a matter of fact, recommend the use of cast-iron, the standard piston. You would not gain much in the use of aluminum-alloy pistons except that they would cut down vibration and perhaps make the engine more snappy at high speeds. They would require rather loose fitting to allow for expansion, which is greater than in cast iron, and this means considerable more noise until the engine has become heated and the pistons have expanded. Again, when loose they will permit more of the unvaporized gasoline to pass the pistons and reach the crankcase and thus dilute the lubricating oil, with possible ill consequences in the way of having the bearings cut for lack of lubrication.

3—This is caused by wear in both the driving pinion and the ring gear. Possibly, too, the bearings that support the differential are worn sufficiently to permit the ring gear to drop enough to put it slightly out of line. The remedy may be in a careful adjustment of the mesh of the pinion and the ring gear. These should be brought together so they will just clear and should be exactly registered; that is, the pinion should exactly fit the ring gear so no part is extended over the edge. After you have made the adjustment and have locked all parts you should be able to run a cigaret paper between the gears without destroying it and yet have the teeth marks show on the paper.

4—About the only remedy for this is to put in new springs and new dogs on the shifting lever. The dogs drop into little holes and the springs hold them there, yet not so tightly as to be immovable. At the same time it will be well to go over the connections between the lever and the shifting fingers in the gearcase to know that there is no great amount of lost motion. Most of this can be taken up.

Noisy Universal Joint

1—I am bothered with a rattling, noisy universal joint on my Overland 83. It is more noticeable when idling, but it can be heard some when on the road. I have packed it well with grease through the plug provided, but after running a short while the rattle continues. Can you suggest a cause and a remedy? Can you tell me just how to go about to disconnect and take it off, as the housing cannot be removed while it is on the shaft.

2—I want to slip new leathers on each end to retain the grease and this is impossible unless disconnected.

3—How about taking off and examining the clutch at the same time?

4—My high gearshifting lever will not stay in place but flies out continually when running. It does not just work out; it jumps out. Just how should I go about to tighten the gearshift lock? Will this remedy the defect?

5—What is there in the proposition of rebuilding or renewing starting and lighting batteries? The service stations tell me to buy a new one, and the battery companies say if rebuilt it will cost half the price of a new one and guarantee it for one year. A new battery generally is guaranteed for only one year or fifteen months. What would you do if you had a two-year-old battery that is just about to give up the ghost? It does the work when run continuously but will not hold the charge.—J. J. Allen, Chicago.

1—A bad universal rattle would indicate the engine is out of alignment and should be rectified. By removing the floorboards and loosening the spacer bolts it will be possible to pry the spacer into the spacer groove of the clutch, using a screwdriver for it. It will then show whether it is open on the top or on the bottom; that is, if the two sides are not parallel. If the opening shows greater on the top it indicates that the engine is too high in the back; if the opening is greater at the bottom your engine is too low in the back. By loosening the bolts which hold the engine in place, shims may be placed under, or taken out from under, the two rear arms to equalize the space between the two sides. It should be adjusted so that by putting up close to the clutch no daylight will be visible. Now turn the engine over a quarter turn so the spacer is vertical and proceed through the same operation, pushing to one side or the other about where the opening may be. Then tighten the engine to the frame.

2—There are no leathers in the propeller shaft housing which will demand removal at any time.

3—By disconnecting the spacer shaft, pulling out the two yoke pins, removing the nuts from the ground rods and the six bolts from the housing, as well as the driving pin out of the universal, the universal joint may be removed and then the housing. New boot leathers may then be installed.

4—When the high gear lever jumps out of engagement it indicates that the spring in the shaft lug on the side of the transmission is too weak. This is illustrated in

Fig. 3. By removing the plug A the spring and interlocker may be removed. Possibly a new spring will remedy the trouble, but it is more likely a new locking plug is needed, inasmuch as this has probably become worn on the end. If this trouble has existed for a considerable time and the car has been driven consistently, it may be found necessary to install a new main shaft drive gear and also a high speed and second gear in the transmission.

5—If your battery is two years old and anybody will rebuild it at half the price of a new one and guarantee it for another year, that would seem to be the logical procedure. It is not likely, however, that a rebuilt battery will hold out for a year.

Carburetion

Flechter Carbureter Adjustment

Q—Publish instructions to adjust and also illustrate these adjustments of a 1-in. Locomotive type of Flechter carbureter.—B. M. Sain, Pittsburgh, Pa.

The Flechter carbureter is shown in Fig. 6. Flechter carbureters are manufactured in single- and double-jet types, adjustments being provided for low and high speed. Both of these adjustments act directly on the air supply. They are on the top of the carbureter, rendering adjustment an easy matter, and since the adjustments lock in any position they may be turned to any point and allowed to remain. Control of the carbureter is by the air valve, the auxiliary valve admitting the air for high speed. This is adjusted by increasing or decreasing the tension on the high speed spring. This is also true of the low-speed spring.

Stove on Saxon Roadster

Q—Publish sketch of stove for the small intake manifold on a 1915 Saxon four, which takes heat from the exhaust header through a flexible tube.—L. Grant, Albuquerque, N. M.

The Saxon four-cylinder engine is equipped with a patented manifold which heats the intake gases after they leave the carbureter. If you want a stove to heat the air before it enters the carbureter, it must be attached to the exhaust pipe which leads out from the combination manifold. A sketch of this is shown in Fig. 5.

Manifold Design on Buick

Q—I have an old Buick, perhaps a 1912, that has never run much and everything is in good shape. It has no magneto and uses dry cells for spark. The engine misses and the trouble seems to be in the carbureter. I can adjust it so it runs all right for a few minutes and then it will miss again. Will it be to any advantage to shorten up the manifold and install a Stewart vacuum system and a new carbureter, or would you advise to junk it?

2—Will it work if I make a manifold as per inclosed sketch?—Herman Meyzig, Berlin, Wis.

1—The trouble is with your carbureter, and the manifold design. Carbureters and manifolds of those days were never designed to handle the fuels of to-day. It is very evident that condensation is taking place within the manifold. A straight manifold of the type you suggest will be much better than the old one now on the machine. The trouble with that type of manifold is that the centrifugal force of the globules of fuel are thrown outward on the bands of the manifold and the cylinder therefore draws in a rarified mixture. The gasoline soon collects at these bends and when the engine is suddenly speeded up all this raw gasoline which has collected is drawn into the cylinder with the result that the engine is choked.

2—Yes. These two types of manifolds are shown in Fig. 4.

Engine Starts Hard

Q—What can I do to assist my Willys-Knight in starting in cold weather? It has always been hard to start when the weather is cold, but runs fine once it is started.—Matt. R. Donovan, Jr., Bernard, Iowa.

Any engine that starts hard should be equipped with some form of primer, operation of which is the work of a second, installation of which is another matter. To keep the starting motor grinding away for several minutes means a rapid discharge of the battery current and in a short time a broken down battery. The money for extra recharging required will more than pay for the primer and with this the engine will start so readily as to become a pleasure rather than an annoyance. A number of primers may be found advertised. You can carry a small hand oil can and prime each cylinder through the priming cup, but this is not so handy as a priming device.

Changing Carbureter Location

Q—I have a 1914 Regal, model T, touring car on which the carbureter is connected to the engine by a long manifold on opposite side of the valves with intake passage cast in cylinder block. Would a change in the location of the carbureter improve the running of this car? Shall I take off the old manifold and replace it with a very short, straight L connection, or put a new manifold on the valve side of the engine and block off the old intake passage? What is a good shape for a manifold? The opening of the carbureter at the throttle is exactly 1⅜ in. Is this correct for this engine? It is an Air-Friction and was sold to me for 1¼ in. I will install vacuum feed if the carbureter is put higher.—J. H. E., St. Louis, Mo.

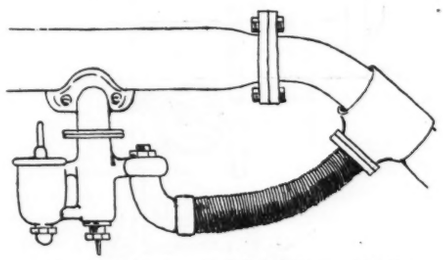


Fig. 5—Stove for small intake manifold on Saxon

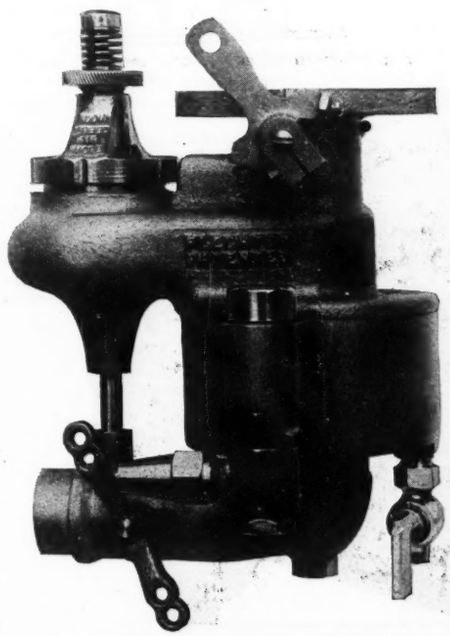


Fig. 6—Flechter carbureter, which has two adjustments

You would not be justified in attempting to alter the design of this car, as you would be doing by your second proposition; besides, it is doubtful if it can be done, because there are no bosses through the waterjackets to form the inlets. The first proposition is more reasonable, and a straight manifold probably will serve the purpose. But making a suitable manifold is a hard job, because it involves a good many problems the designers have worked on for years. A 1¼-in. carbureter is sufficiently large for this car.

Engines

Manifold for Ford

Q—How can I make an exhaust manifold for a Ford car? How should this be fastened to the front block to run it along the outside of the car?—Ralph Beers, Detroit.

Perhaps the case of one reader of MOTOR AGE who converted a Ford into a racing car will serve in this instance. In the case mentioned each end of the intake manifold had a collar brazed or welded about ⅛ in. from the end; also the exhaust pipes, which were of steel tubing, and ran out through the hood. A copper-asbestos gasket was slipped over the end of the manifold and made a tight fit between the collar and the cylinder casting. Manifolds were held on by crows' feet, which were slipped over the original studs and bore against the outside of the collars.

Why Engine Misses

Q—Referring to my letter regarding engine trouble in a 1915 model Dodge Brothers touring car, your answer in Motor Age and cut of a 1915 Dodge Brothers Stewart carbureter is incorrect in that the model shown could not be used on a 1915 model, since the generator on this model sets so far back the carbureter must have an offset in the gooseneck to go around it. My car misses irregularly, although your suggestions have been followed carefully. The carbureter and magneto worked fine when tried on another car of same model and make. I tried everything but another block without results. Three different carbureters, a new magneto, new wiring, including new spark plugs, installed new valves, pistons and rings and reground seats of valves, carefully adjusted valve tappets to have plenty of space, tried new valve springs throughout. To prove out vacuum tank and gasoline feed lines from carbureter, I installed a 1-gal. tank overhead in front of the dash or cowl and fed gasoline to the carbureter from this can. I put in new engine gaskets and carefully searched for any water leak in engine head and block. I have had a Dodge Brothers field man adjust the carbureter, also three other Dodge agency repairmen to try their best, without results.

The engine, when cold and by use of choker, will run pretty well and start easy on low gear but loses power and begins to miss when thrown into high gear. It misses on two cylinders. After getting hot it will hit pretty well at excessive speeds, but loads up and spits back through the carbureter with same adjustment at 20 to 30 m.p.h. It fires sometimes three or four times than misses one or more times irregularly but keeps on doing this. It has low power on hills and seems to both load and miss and spit through carbureter on a pull. On high at 4 to 5 m.p.h. on level city streets it hits as regularly as can be, but will not pick up or accelerate evenly. I have a good stove and hot-air attachment. I tried breaking up and spraying a finer mixture by installing a screen between the carbureter and the engine block on intake manifold with no results. I believe the trouble must be caused by either two of the intake valves intermittently sticking in the guides, or else the gasoline mixture has too low a velocity in the intake manifold.

I have word from L. I. Gray at Kansas City stating that he stopped a very similar trouble by reducing the size of the intake manifold by inserting a 1-in. tube through which the gases

must pass on the way to intake valves, the reduction in the size of the manifold causing higher velocity of the mixture and reducing the chance for condensation. I am going to try this theory as soon as the roads become passable so the car can be tried out. I am also going to dress down the intake valve stems, although they seem to fit very freely. Can you offer any further suggestions?—W. L. Brown, McPherson, Kan.

Offering any suggestions for the improvement of the irregular missing may perhaps appear to be useless, especially after trying the numerous things that you have tried. The writer once knew a man whose car acted a great deal as yours is acting. A world of things were tried to remedy this condition but to no avail. One day when the cylinders were being rebored it was noticed that the cylinder had worn to an elliptical shape in the direction of the crankshaft. No reason could be found for the elliptical shape of the cylinder until after some hot water had been placed in the waterjacket to remove the scale and sediment which might be in the water space. It was noticed that the place of wearing had occurred at a position that did not get warm, and this was later found to be due to some core sand that had been removed from the block. This will illustrate the fact that there are many little things which might interfere with the successful operation of the engine.

Assuming that you are sure of the perfect condition of the valves in the engine, that the timing is correct, that the spark occurs at the right time, that you have good compression, then look for these things: A contact point on the low-tension side of the magneto that apparently makes good contact upon a superficial examination but might very probably vibrate enough to cause an intermittent effect such as you have. This also applies to the high-tension side of the magneto. Your wiring may be of an excellent nature, but how is the apparatus the wires connect? For instance, the ignition switch itself has been known to cause trouble of the self-same nature.

Condensation within the manifold, due to a rarifying of the mixture caused by a sudden expansion after leaving the carbureter, sometimes will set up within the manifold an effect similar to the vibrating of air in organ pipe. The cross-sectional area of the manifold should not be very much larger than the carbureter cross-section and, as you suggest you are going to do, it will be advisable to cut this area down.

Oakland Piston Rings

In the Jan. 2 issue of MOTOR AGE the statement was made that the Oakland cars are now equipped with a four-ring piston. This is a mistake, as the two-ring construction used on the model 34-B was replaced with a three-ring type about four months ago.

Lost Power in Engine

Q—My Hudson 1915, 6-40, has developed a knock. I have had the bearings taken up, new rings put on the pistons and the carbon removed. It has the Delco ignition starting and lighting system. The car runs smoothly on good level roads or on medium grade hills, but on a good pull it will not make it on high and starts knocking, which cannot be stopped by retarding the spark or changing into second gear. It is not exactly a knock, but seems to be a rattle as if the whole engine was tearing. When given full throttle on good road it will not develop more than 35 m.p.h. When it has reached 35 m.p.h. it will stay there without spitting or backfiring. I have tried several different carbureters, but they do not change it.—Paul Ward, West Middletown, Ohio.

Loss of compression is one factor that enters into the lost power question more than any other thing. The valve timing is assumed to be correct in making this statement. Compression is lost either in the valves or in the piston. You do not state that in having the engine overhauled, the valves were ground in. The knock, or vibration, which shakes the engine up is probably due to this very fact. If cylinders 5 and 6, for example, are low in compression, the majority of your power is being developed in the fore part of the engine. This is bound to cause vibration and at lower speeds under load will sound like a knock. It will do well to check up the spark, its intensity and the spark-plug gap, which should be equal to the thickness of a worn dime. By screwing a gage—any ordinary pressure gage, water or steam—into the spark plug or petcock opening the compression can be checked up when the engine is turned over by hand. Be sure that each cylinder is tried at about the same pull on the crank.

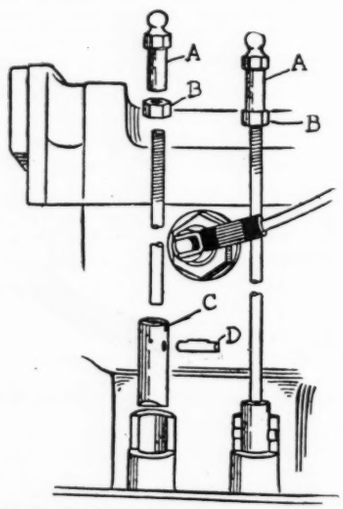


Fig. 8—Pushrod adjustment members on Chevrolet

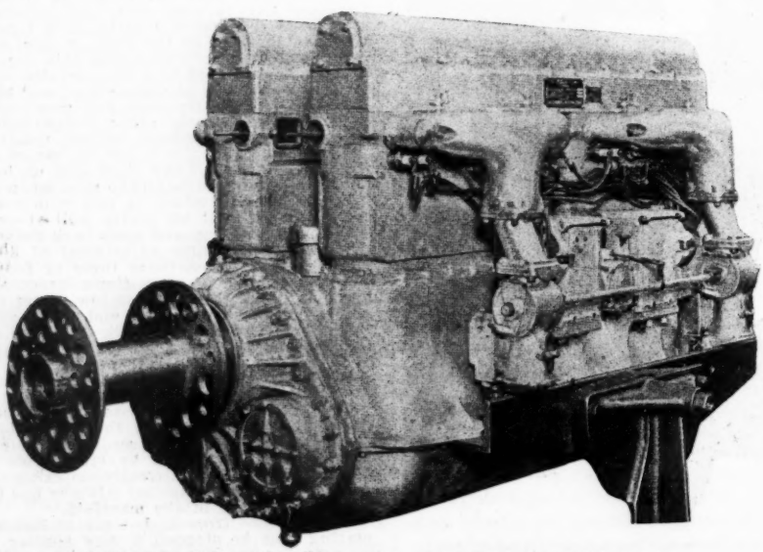


Fig. 7—Three-quarters view of sixteen-cylinder Bugatti engine

Water for Oil Engines

1—Publish photo of Bugatti airplane engine.
2—How many cylinders has it?
3—What is the bore and stroke of same?—Guillermo Oihoa, Mexico.

1—This is shown in Fig. 7.

2—Sixteen.

3—4.3 by 6.3 in.

Cause of Knock

Q—Is there such a thing as high compression resulting in a very bad knock similar to a carbon knock? That is, barring carbon and ignition or timing trouble, what could be the cause of a very bad rasping knock in an engine under but a slight pull?—George F. Noisom, Battle Creek, Mich.

1—Yes, too high compression will cause a knock. High compression may be causing your trouble, but it might also be a loose connecting rod bearing.

Water for Oil Engines

Q—Of what good is the water vapor which enters the combustion mixtures of a great many kerosene engines of today? I know dry gases fail to explode at low temperatures unless moisture is present. The moisture present in the atmosphere in conjunction with the high temperature of the electric spark seem to make further addition of moisture unnecessary. Chemical dissociation and re-combination of the water would exactly neutralize one another on account of the endothermic and exothermic values being equal. It would seem, therefore, that the water vapor merely dilutes or envelopes the oxygen and kerosene molecules, thereby causing the mixture to burn more slowly and avoiding the violent knocking explosion.

As to the part water plays in removing carbon, I would attribute the latter to physical, not chemical action. It may be assumed the high temperature of the explosion dissociates the water into hydrogen and oxygen and the oxygen combines with free carbon to form carbon dioxide. If this were so, why should not an excess of air with its accompanying oxygen produce the same effect? It seems that some of the moist vapor on coming in contact with the cooling carbon during the intake stroke is absorbed and the vapor is rapidly expanded during the following explosion with disruptive results to the carbon.—A. P. Herff, San Antonio, Tex.

There is one big practical difference between the gas engine and the oil engine. The gas engine can have its fuel perfectly carbureted so a true gas exists in the cylinder. In the oil engine the fuel is not carbureted but is atomized. This means that in the cylinder of the oil engine small drops of fuel burn as a liquid and consequently give off large volumes of gas during the combustion. If this fuel is allowed to burn rapidly within the cylinder, as it does, large volumes are created almost instantly, and they are productive of knocking. The water serves in this case as a blanket and slows up the rapid combustion. As to dissociation, it no doubt takes place

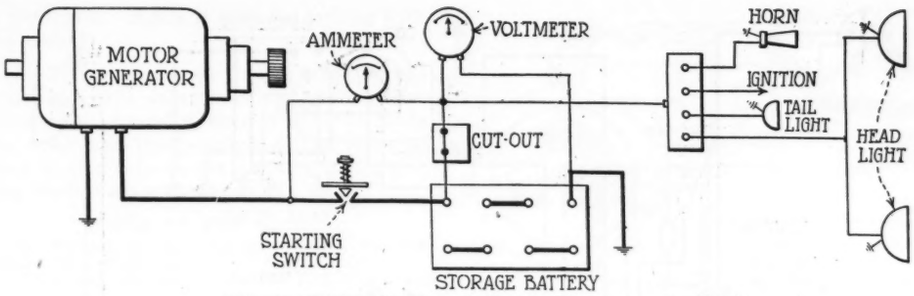


Fig. 9—Wiring diagram similar to Deaco on motor boat

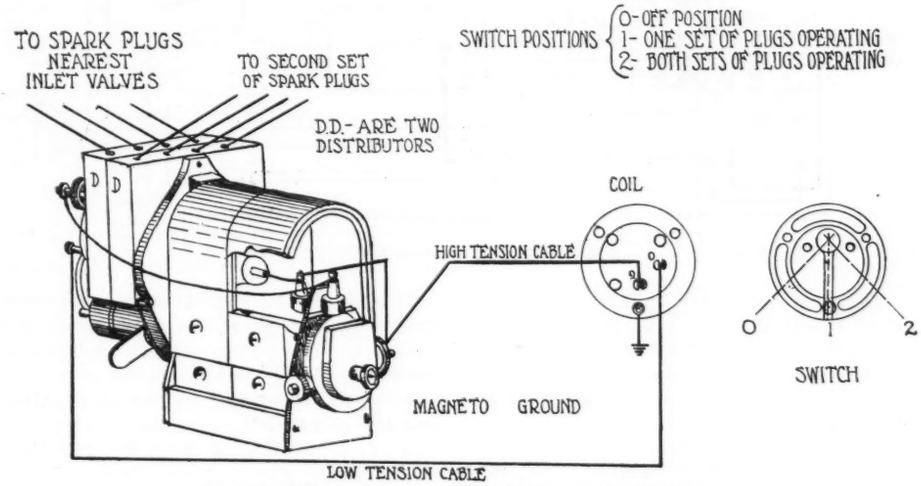


Fig. 10—Wiring diagram of Bosch two-spark magneto

and with some benefits. Water dissociates at a temperature of 1400 to 1600 deg. Fahr., and when the dissociation takes place within the cylinder re-combination will not take place completely because the temperatures do not reach the re-combining range until exhaust is almost completed. The time which is left is not sufficient for re-combination to occur completely. This, of course, will leave some free oxygen to combine with the carbon.

Misses On Two Cylinders

Q—I have a model 24 Buick roadster equipped with an old Schebler carbureter with gravity feed. I had the engine overhauled. Now it continually misses on the first and last cylinders and heats. Experts claim ignition is all right. It makes no difference whether I run fast or slow; it has no power on pulls.—R. H. Schatz, Minot, N. D.

In the first place there are indications that the timing is wrong, but it is difficult to determine what causes the first and last cylinders to misfire without an opportunity of making a close inspection of the engine. This might be caused by leaky valves, especially those on the intake side or lack of compression because of the rings being fouled to the extent that they adhere to the pistons.

It is not an infrequent thing to find that, where the valves have been ground in a good many times, the valve seat becomes pocketed and the face of the seat considerably wider than originally. This tends to prevent the valve from seating and calls for reaming out the seat to remove the edge that has been formed. By this means the valve seat will be lessened in width and will permit compression being held more readily. If the valves, particularly those on the intake sides, have become very badly worn from grinding they may need replacing with new ones.

It also may be found that new rings are needed or that the cylinder walls are out of round and need to be reground. This, of course, will call for oversize pistons and new rings all through. It will not do to regrind two cylinders alone, for this would throw the engine out of balance.

Overheating and loss of power will be caused by late ignition or incorrect valve timing. To check up on ignition timing, place No. 1 piston on top dead center, compression stroke, seeing that the valves of this cylinder are free. Then retard the spark lever as far as possible. At this position the break should just begin. If it begins after this point it is too late. Set it to begin to break when the piston is in the position named and the lever is fully retarded.

Engine Valves and Knock

Q—Suggest a different valve lock that will not do so much clicking for a Chevrolet 490.

2—I have driven a Royal Mail Chevrolet roadster 28,000 miles. When the engine is idling it knocks as each cylinder fires. Is this caused by too much play in the timing gears?

3—What marks are upon a Buick flywheel when No. 1 cylinder is firing?—Guy Weese, Frankford, Ont.

1—In Fig. 8 are shown the Chevrolet 490 pushrod adjustment members. The adjustment is made by turning A up to tighten and down to loosen, and this is held from changing positions by the locknut B. If there is just enough clearance between the ball on the top of A and the rocker arm, there should be practically no noise or clicking. If there is, look to the pushrod guide assembly, and see if there is play there. It may be the pin D and the slot into which it is placed have become worn or that the pushrod or its guide need replacing.

2—It is probably a piston slap or perhaps a loose wristpin. The latter will be more noticeable on a hard pull, however. The piston slap will be present at all speeds. If the cylinders are perfectly true, oversize pistons could be fitted, after being ground to clear 0.002 in. If the cylinders are not true, they will have to be reground and new pistons fitted.

3—None unless the flywheel is marked for dead center. In the Buick engine the exhaust valve closes 2½ in. after center, the intake opens 3 in. after center, the exhaust opens 5½ in. before bottom center and the intake closes 3½ in. after bottom center. Just at the point of firing the two valves for a particular cylinder should be closed and this may be told by trying them, to see if there is a little play between the pushrod and the rocker arms, as there should be.

The Electric System

Concerning Delco Farm Light

Q—Can a 60-volt rheostat be used on a 32-volt Delco-Light plant?

2—If so, show wiring diagram.—F. W. Lesmeister, Selz, N. D.

1—The Delco-Light plant comes complete and it is not necessary to use any external resistance, but if you are intending to control the voltage beyond the limits of the control of the system, then the 60-volt rheostat can be used, but the control will not be quite so delicate as it would be if a lower voltage resistance were used.

2—The diagram for this is shown in Fif. 14.

Deaco on Motor Boat

Q—I have a Deaco model UF type SG starter and motor-generator. I have had it running at an armature speed of 1800 r.p.m., which was necessary to make it work through the cut-out. It makes the fields very warm, in fact, the whole machine gets so hot that it cannot be handled comfortably at lower speed than 1800 r.p.m. with the cut-out open. I have thought that perhaps the arrangement of the maker was to use two 6-volt batteries and the combined 12 volts in starting only.

2—Give wiring of this as a starter and generator, also as a generator only with one 6-volt

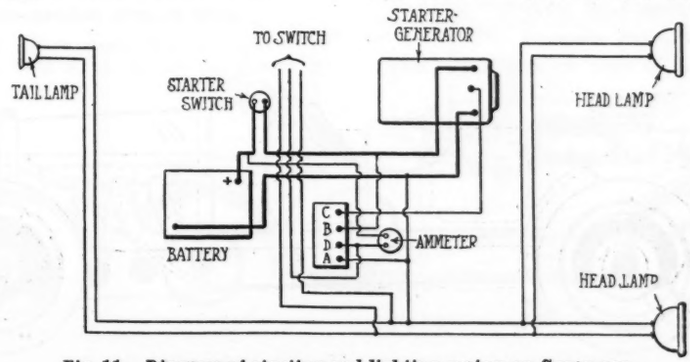


Fig. 11—Diagram of starting and lighting system on Saxon car

battery charging at a time with ammeter and volt-meter connected. I want to use this as a generator on a cabin cruiser, but would also like for it to start the engine if possible.—Carl Thorden, Buffalo, N. Y.

1—From the records that we have concerning this Deaco model we find that it is an 8-16 volt system primarily, the starter using 16 volts and the lights 8.

2—This is shown in Fig. 9. It is shown in a diagrammatic way, since you are thinking of installing the system in a boat. This makes it very much simpler and easier to read. It is entirely feasible to operate this system both as a starter and a generator.

Ammeter on Saxon

Q—My Saxon 14 is equipped with a Detroit one-unit starter and generator. Is it possible to connect an ammeter into the circuit somewhere? Show diagram?—V. Steinborn, Chicago.

The ammeter connection is shown in Fig. 11.

Duplex Magneto Explained

Q—I have a model ZR4 Bosch magneto. Why is this called a duplex magneto? This magneto has two terminals, one marked M1 and the other marked M11. Of what use is the second terminal? When M1 is grounded it stops ignition. M11 does not. Is this magneto designed for the use of batteries in any way or can it be used with a double distributer? I want to use this on a Reo which I have built into a truck. Is there any objection to putting this on the cast-iron bracket on this model? Some makers claim their product must be mounted on at least ½ in. brass or aluminum. Why is this? This magneto operates clockwise.

2—Where can I get a book devoted entirely to the care and repair of magnetos?—J. H. Wyle, Dix, Neb.

1—The purpose of the Bosch two-spark magneto, known as ZR4, is to produce ignition through two plugs in each cylinder. It is used more commonly on T-head engines, or where one plug is located at the top of the combustion chamber and another on the side. Theoretically, it is to reduce the time interval between ignition and complete combustion. The result is to reduce the ignition advance necessary and thus secure an increase in the efficiency and output of the engine.

Fig. 13 shows the wiring diagram. In this type of magneto two slipring brushes are provided horizontally mounted in brush holders on opposite sides of the shaft end plate. During the portions of the armature rotation when the high-tension current is being delivered each of the two slipring segments will be in contact with one of the brushes. One brush is connected with the inner distributer by a conducting bar similar to that used on a single-spark magneto, the second slipring brush being connected to the outer distributer by a short length of cable passing around the magnet. The rotating distributer piece is of double length and carries two brushes insulated from each other.

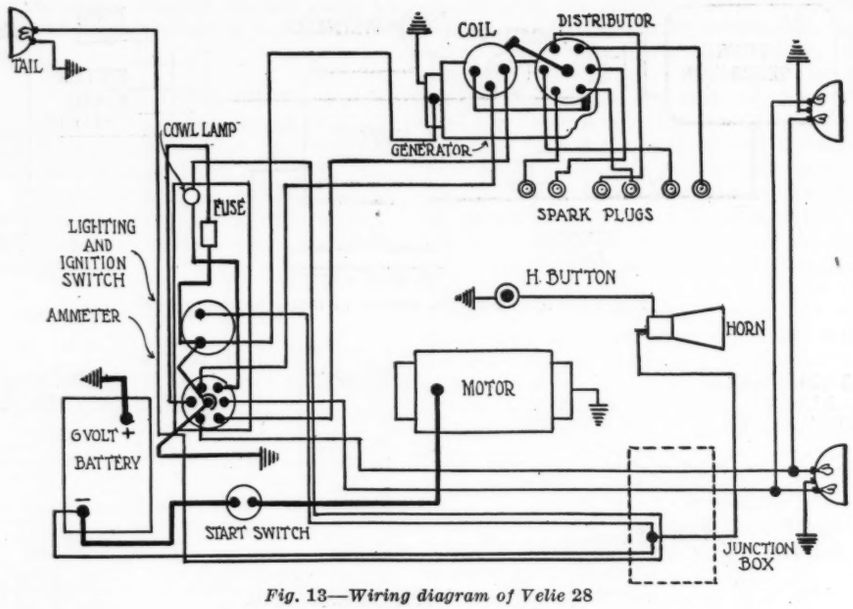


Fig. 13—Wiring diagram of Velie 28

The use of two-spark ignition permits the ignition lead to be cut down anywhere from 30 to 50 per cent. If the timing is correct for two-spark ignition and one of the series of spark plugs is cut out of action, the remaining series will operate considerably in retard of what it would if the engine were timed for single-spark ignition. If two-spark ignition provides the full advance, the effect of retarding the spark may be obtained by cutting out one series of plugs.

The switch provided for the two-spark independent magneto is so arranged that ignition may be secured either with both sets of plugs or with only one set, the purpose of this being to give the effect of retarding the spark without altering the relation between the interrupter opening and the armature, as is done under normal conditions.

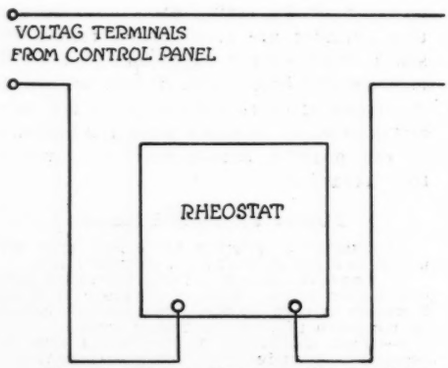


Fig. 14—Wiring diagram with rheostat used in farm lighting system

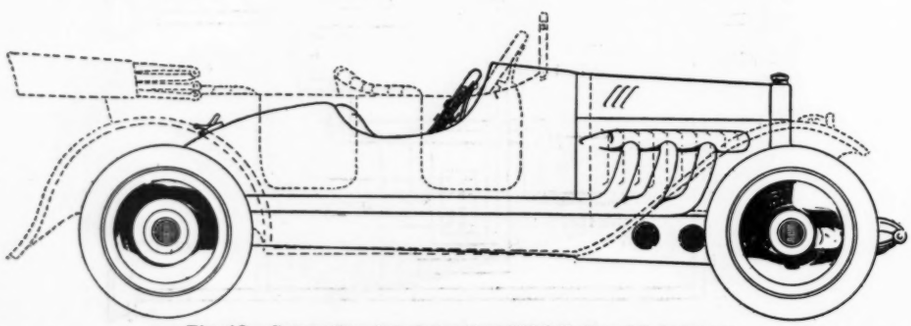


Fig. 12—Suggestion for converting 1914 National into racer

The connection should be so made that the system of plugs operative when the switch is thrown to the single position is located near the inlet valve.

2—Many books are devoted to ignition, starting and lighting, and these can be secured from the U. P. C. Book Co., 243 West Thirty-ninth street, New York. These books are advertised in MOTOR AGE.

Battery Discharges Easily

Q—What causes the battery on 1914 Cadillac car to discharge? When I have battery charged and placed in car it will stay charged only three or four days, sometimes will discharge over night. The battery is O. K. Can the trouble be with the generator or wiring?—Charles H. Allen, La Rue, Ohio.

You may be sure your battery will not be O. K. if it is permitted to discharge over night many times. It calls for a complete test of the entire wiring system, for there is evidently a short circuit somewhere.

Information on Delco

Q—Publish information on the Delco starting and lighting system or tell where can books on same be obtained?—Ray Shinn, Keokuk, Iowa.

This system was considered in full in MOTOR AGE for Oct. 17-Dec. 5, inclusive, in the series "Electrical Equipment of the Motor Car." Instruction books can be obtained from the Dayton Engineering Laboratories Co., Dayton, Ohio.

Overcharging Battery

Q—Can the generator overcharge the battery of a Jeffrey car, charged to 1275?

2—How long can the car run not using the starter and the lights and the battery being charged to its capacity, in other words, charged to 1275, and the battery in good shape?

3—Can the generator burn the battery?—M. A. Barbier, New Orleans, La.

1—Yes, if the cut-out is not in working order. In the 1915, 1916 and 1917 Jeffery cars the Delco cut-out was used. If there is a tendency to overcharge, burn your lights to keep the current down. This will require frequent testing with a voltmeter. Better see that the cut-out is working and save worry.

2—If you mean for ignition purposes only, it will be safe to run for a month, but a battery should be charged at least once a month when not being changed by

a generator. Again it calls for testing with frequency.

3—When the cut-out is not working the generator will overcharge the battery, but it will not, literally, burn it out. It tends to wash out the positive active material and it also acts on the positive grids, giving them a scaly appearance.

Wiring of 1915 Maxwell

Q—Publish wiring diagram for 1915 Maxwell Model 25.—Dick Davis, Los Angeles, Cal.

This was shown in MOTOR AGE for Jan.

Wiring of 1913 Mitchell

Q—Publish wiring diagram of the 1913 Mitchell six. Show how generator is connected on this car. Why are there two circuits instead of one?—H. F. Murray, Geddes, S. Dak.

These were shown on page 45 of MOTOR AGE for Jan. 9. The Esterline system was used on the earlier cars in this series, while the Splitdorf-Apelco was used on those of the latter part of 1913.

Must Use Direct Current

Q—The Oct. 31 issue tells how to use direct 110-volt current for charging storage batteries. How can I use 110-volt alternating current? Where can I get the necessary material and what is the approximate cost?—W. D. Benghardt, Whitney Point, N. Y.

Storage batteries cannot be charged with alternating current unless some rectifying means is used, such as a motor-generator, electrolytic, mercury vapor or the vibrating type. These are expensive, costing several hundred dollars.

Velie Electrical Questions

Q—I recently purchased a 1917 Velie, model 28-5, second-hand, and expect to strip it down for a speedster. Show a wiring diagram for ignition, lights and starter for the Remy system used on this car.

2—The car has been in dead storage for the last ten months and the battery is dry. Is it good policy to leave the battery in this condition till next spring, when I expect to have the car ready for use, or have it overhauled immediately? If I have it fixed up now it will be very inconvenient to keep it charged, as it will have to be shipped 200 miles every time.

3—Is it necessary to ground the generator wires on this system to run the engine without battery connected? Also, how do you connect the dry cells.—Mark F. Grady, Browning, Mont.

1—This is shown in Fig. 13.

2—If the battery was in a discharged condition before it was allowed to dry up, it is probably ruined now. But if the cells were fully charged, there is some hope of restoring the battery to its normal condition. At any rate it will do no further harm to leave the battery in its present shape until it is wanted for use.

3—On this system the negative wire of the battery is grounded and if the battery is not connected into the circuit the positive lead must also be grounded so that the current will have a complete circuit to travel.

Battery Voltages

Q—What is the difference in the voltage of a battery 6-8, 6-7 and 6 volt?

2—What is the charging rate on the different voltage?—A. M. Semrau, Odessa, Minn.

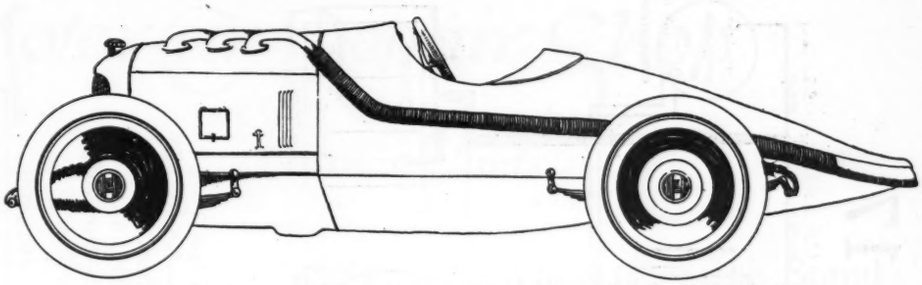


Fig. 16—Suggestion for racing car of fast lines, streamline throughout

1—There is practically no difference in these ratings. Manufacturers have different methods for rating their batteries and generators, but the voltage of 6-8 system and a 6-volt system, both being fully charged, is the same.

2—The charging rate of a battery is dependent upon the capacity and not the voltage.

Rebuilding

Racing Car Design

Q—Give addresses of concerns who manufacture the Frontenac and Delage engines? I am going to build a racing car and intend using one of these engines.

2—Publish illustrations of all the racing cars on the market.

3—Show design of snappy style body that will cut wind pressure at high.—Ray Weisenmayer, Fort Leavenworth, Kan.

1—The Frontenac engine was designed by Louis Chevrolet and built under his personal supervision. These cars were built in Detroit, and they were the only ones of their kind ever constructed. Mr. Chevrolet has the peculiar habit of building racing cars wherever he happens to be spending his vacations or his spare time, so it would not be possible to secure an engine similar to the one he used in the Frontenac unless the original were at hand to build from. The Delage cars and engines are made in France.

2—For obvious reasons it is impossible for MOTOR AGE to comply with this request. If we did so, a special issue would have to be compiled, which probably would be larger than our annual show issue. MOTOR AGE, from time to time, has illustrated practically all racing cars.

3—Fig. 16 shows a racing car of fast lines and one whose lines are streamline in the true sense of the word.

Modifying Ford Roadster

Q—Show illustration and give instructions for fitting a Chevrolet roadster body on a Ford roadster 1918 model.

2—What are the largest oversize tires I can put on my Ford roadster? Could I use a 32 by 3½ tire all around? What advantage would this be?—D. C. Williams, Detroit.

1—It will be very difficult to fit a Chevrolet body to a Ford chassis. Most of the fitting will have to be developed as the work progresses, because the Ford hood will have to be replaced and the length of the new one will be a matter of some choice. Then the steering wheel offers a difficulty. A steering gear will have to be fitted, and the desired angle of the wheel is another problem. There are so many dimensions that will have to be made and to the ⅛-in., most of which can only be had by actual measurement.

2—It would be possible to fit any size tires so long as they did not come in contact with the fender, but it would not be advisable. By using 32 by 3½-in. tires you would materially raise the gear ratio, the tires would come too near the fenders, the center of gravity would be raised and the expense would be in excess of beneficial results, if there were any, which is doubtful. It is not, however, uncommon to use 30 by 3½-in. or even 30 by 4-in tires on Fords, but it will be well to make sure about the new stock sizes that are to be manufactured hereafter. By using 30 by 3½-in. you will have no trouble in securing tires. They are amply large for all ordinary work, and, still better, you can secure complete demountable rims, felloes and spokes all ready to attach to your present hubs. It will require little work to make the change and a complete set of five can be obtained for under $20.

Wants Ford Speedster

Q—Publish sketch of a 1914 Ford converted into a speedster.—Otto Delfs, Inman, Kan.

MOTOR AGE has published many suggestions for converting cars into speedsters. Look over the Readers' Clearing House pages for the last few issues and see if you cannot find just what you want. If not, call on us again.

National Rebuilt as Racer

Q—Publish sketch of racing type of body without fenders for 1914 National.—Chester E. Hueman, Seattle, Wash.

A 1914 National equipped with a racing type body is shown in Fig. 12.

Speedster on Buick.

Q—Give suggestion for speedster body on 1913 Buick touring, using same hood with crown fenders.—W. M. Bramhall, Paris, Tex.

This was shown on page 45, Fig. 13.

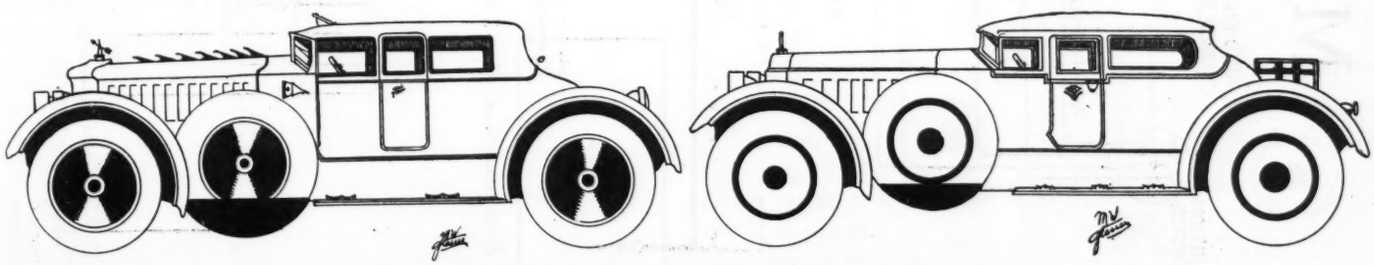
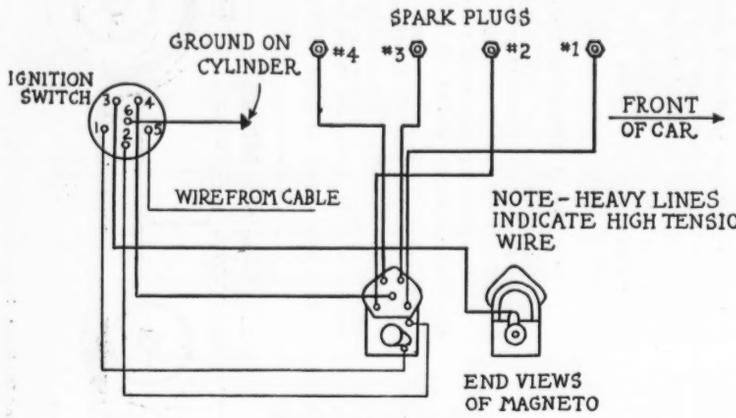


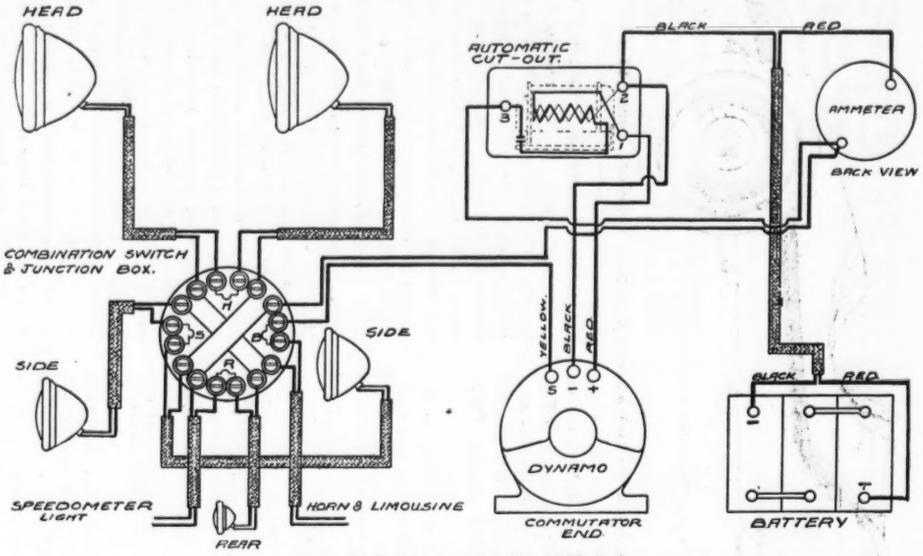
Fig. 15—Original designs by a reader, M. W. Glazier, of Madison, Wis.

Motor Age Wiring Diagram Chart No. 17

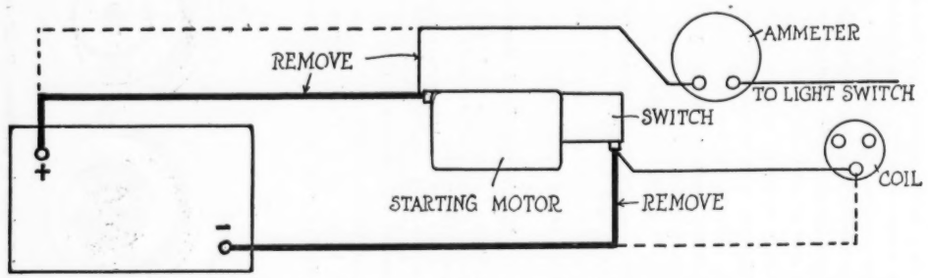


Bosch system on Case

Alter—Nov. 14
Buick—Nov. 21
Cadillac—Dec. 19
Chalmers—Feb. 20
Chevrolet—Nov. 28
Cole—Jan. 23
Dodge—Dec. 12
Ford—Jan. 30
Hudson—Dec. 5
Hupmobile—Feb. 13

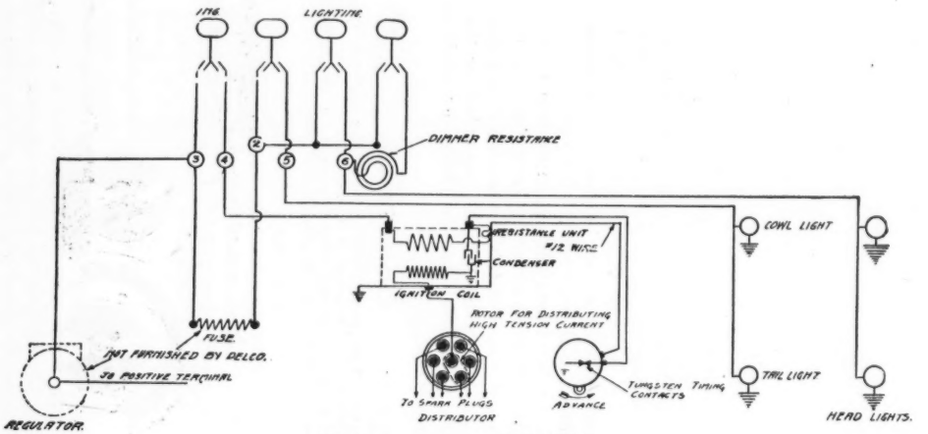


Gray & Davis system for 1913 Reo

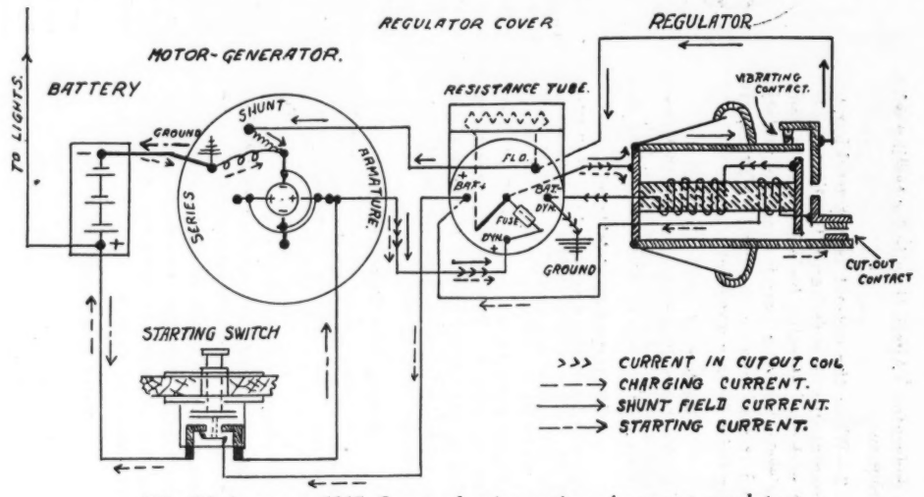


How connections should be made on model K Reo when driving without starting motor

Krit—Feb. 6
Locomobile—Jan. 23
Marmon—Jan. 9
Maxwell—Jan. 16
Mercer—Jan. 23
Mitchell—Jan. 9
Oakland—Jan. 2
Oldsmobile—Jan. 23
Overland—Nov. 7-14
Regal—Feb. 6
Scripps-Booth—Dec. 26
Studebaker—Dec. 26



Wagner system on 1917 Elgin



Allis-Chalmers on 1915 Grant, showing action of current regulator

The Motor Car Repair Shop

Practical Maintenance Hints

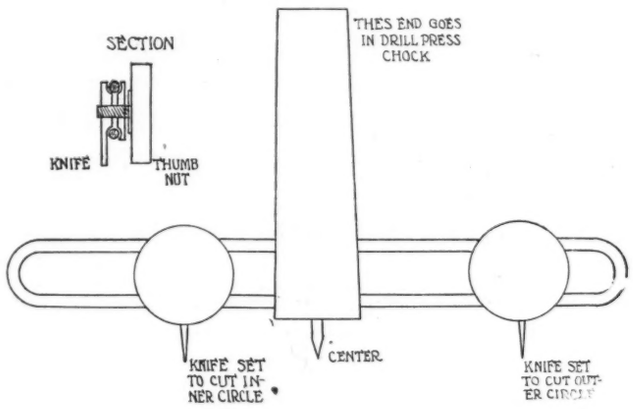
Powerful Socket Wrench

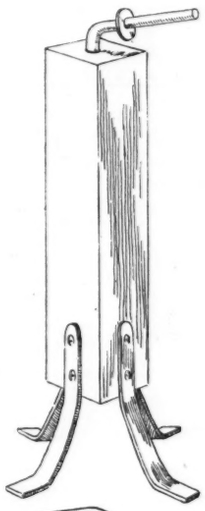
Loosening large, inaccessible nuts, which are more common on trucks than passenger cars, is readily done by using a socket wrench specially made for the purpose and used with a large Stilson wrench to provide the leverage.

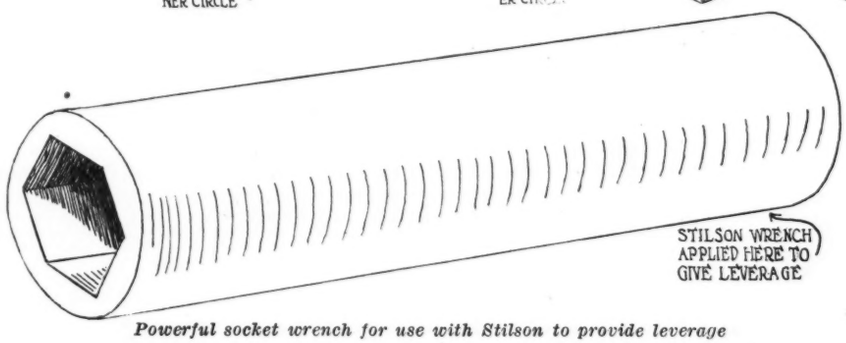
Unequalized Brakes

Unequally adjusted brakes often cause rapid tire wear or dangerous skidding on wet pavement without the owner suspecting the cause. The brakes may stop the car quite rapidly but most, or perhaps all the stopping, due to unequal adjustment is done by one wheel. In a quick stop the result is that one wheel slides and soon the tread becomes so rubbed and gashed by sliding over sharp stones that it is on its way to early ruin. The safest way to tell whether the brakes are equalized is to allow some one else to drive the car while you stand at the side of the road. Just as he passes have him apply both brakes suddenly for an instant and note which wheel locks first.

Gasket cutter compass, below, and wheel painting stand







Powerful socket wrench for use with Stilson to provide leverage

Wheel Painting Stand

The painting of a wheel, or for that matter any work on a wheel, is facilitated by mounting it on the wheel stand shown. The stand should be substantially built with a broad base. The spindle engaging the hub of the wheel is tilted up at a slight angle so the wheel will not slide off when it is rotated. The spindle is swiveled in the stand so the wheel may be swung to any angle.

Gasket Cutter Compass

An instrument for cutting circular gaskets consists of a center point and two adjustable knives which may be moved in and out radially. One knife is set to the inside radius of the gasket and the other to the outside radius. Then the tool is chucked in a drill press, the gasket material mounted on a wood block on the bed, and the tool fed into the gasket.—Fisher Proctor, Inc., Stewart trucks, Boston, Mass.

Oversize Tires

When oversize tires are put on be sure there is sufficient clearance between all tires and adjacent parts of the car. It is especially important to note this when the car is heavily loaded, as then the overhead clearance between wheels and fenders is at its minimum. Look carefully to see whether if when the springs are severely compressed, as when striking a large bump, there is any danger of the tires coming in contact with anything which might injure.

Speedometer Shaft

A cowl squeak often may be traced to a speedometer shaft, which needs lubrication. If this is found to be the case, it should not be neglected an instant longer than necessary, because of danger of the shaft breaking. Vaseline or a very soft grease should be used in repacking.

Serial Numbers of Passenger Cars

Motor Age Maintenance Data Sheet No. 27

VELIE

Year	Model	Cyls	Price	Serial Numbers
1911-12	G	4	$2000	14000-15000
1913	32	4	1350	25000-31326
	S-T	4	2000	16000-16725
1914	Series 9	4	2000	17301-19251
	Series 10	6	2350	17001-17300
1915	15	6	1595	19500-20690
	11	4	1500	32101-32500
1916	22	6	1065	35000-35999
1917	28	6	1135	50000-60000
	27	6	1600	40000-49999
1918	38	6	1340	50000 up
	39	6	1595	40000 up

WESTCOTT

Year	Model	Cyls	Price	Serial Numbers
1912	KLM	4	$1800	
	R	4	2250	
1913	4-40	4	1975	
	6-50	6	2475	
1914	30	4	1385	800-1102
	6-60	6	2485	
1915	O-35	4	1185	1103-1348
	U-50	6	1585	1500-1699
1916	41	6	1295	4001-4200
	42	6	1445	4201-5100
	51	6	1595	4599-5402
1917	17	6	1590	5501-6292
1918	18	6	1890	6293-7200
	18-A	6	2290	7201 up Number on dash plate

WINTON

Year	Model	Cyls	Price	Serial Numbers
1912	17-C	6	$3000	11216-12482
1913	17-D	6	3250	12490-14757
1914	20	6	3500	15000-16030
1915	21 and 21-A	6	3500	(21) 17000-18037
			2435	(21-A) 20000-21300
1916	22 and 22-A	6	3500	(22) 25000-25495
			2335	(22-A) 30000-31961
1917	22 and 22-A	6	3500	(22) 26000-26612
			2735	(22-A) 32000-33621
1918	22 and 22-A	6	....	(22) 26614 to ....
				(22-A) 33622 to ....

Motor Age Monthly Farm-Lighting Specification Tables

Name and Model	Maker	Watts capacity	No. 20 watt lamps	Lamp voltages	No. cyl'd's	No. cycles	Make of engine	Horsepower	Fuel	Cooling	Power pulley	Generator drive	Make of generator	Make of battery	Battery amp. hours	Battery, volt	No. cells	Starting engine	Stopping engine	Governor, type	Price
Aerothrust	Aerothrust Engine Co., La Porte, Ind	....	15–25	....	2	2	.....	3	.....	Air	Opt.	Shaft	.....	.....	60	28–42	.....	.....	.....	.....	.....
Alamo	Alamo Farm Light Co., Omaha, Neb	1000	75–120	40	1	4	Ide	1¼	.....	Water	.....	Direct	.....	.....	.....	.....	16	.....	.....	Throttle	.....
Alco	Automatic Light Co., Minneapolis, Minn	750	40	110	1	4	Alco	2	G	Water	Opt.	Direct	GE Alco	Willard	76	6	3	Auto.	Auto.	Electro sole.	$ 375
		850	55–75	32	1	4	Alco	2	G	Water	Opt.	Direct	GE Alco	Willard	80	32	.....	S-Auto.	Auto.	Electro sole.	450
Cushman, A	Cushman Motor Works, Lincoln, Neb	1000	20–70	32	1	4	Own	4	.....	Water	Yes	Belt	Imperial	.....	80	32	16	S-Auto.	S auto.	Throttle	.....
B		1000	25–75	32	1	..	Own	4	.....	Water	Yes	Belt	Imperial	.....	120	32	16	S Auto.	S auto.	Throttle	.....
E		1000	50–100	32	1	4	Own	4	.....	Water	Yes	Belt	Imperial	.....	180	32	16	S Auto.	S auto.	Throttle	.....
Delco, ¾ KW, 32 volt	Domestic Engineering Co., Dayton, Ohio	750	20–72	32	1	4	Own	1½	K	Air	No	Direct	Own	Exide	80–160	32	16	S-Auto.	Auto.	Voltage	425–490
3 KW, 32-volt		3000	150	32	1	4	Own	5	K	Air	No	Direct	Own	Exide	80–160	32	16	S-Auto.	Auto.	Voltage	900
3 KW, 110-volt		3000	150	110	1	4	Own	5	K	Air	No	Direct	Own	Exide	80–160	112	36	S-Auto.	Auto.	Voltage	1,200
Dyneto, 5	Dyneto Electric Co., Syracuse, N. Y	600	20–42	32	1	4	Novo	1½	.....	Water	Opt.	Belt	Own	Willard	53	32	16	S-Auto.	S-Auto.	.....	385
7		....	16–54	32	1	4	Novo	1½	.....	Water	Opt.	Belt	Own	Willard	80	32	16	S-Auto.	S-Auto.	.....	410
9		....	23–65	32	1	4	Novo	1½	.....	Water	Opt.	Belt	Own	Willard	110	32	16	S-Auto.	S-Auto.	.....	460
Fairbanks-Morse, F-3 hp	Fairbanks, Morse & Co., Chicago	900	13–100	30	1	4	Own	3	K	Water	.....	Belt	Own	.....	66	32	16	S-Auto.	Manual	.....	.....
F-6 hp		3500	40–200	30	1	..	Own	6	K	Water	.....	Belt	Own	.....	200	32	16	S-Auto.	Manual	.....	.....
Fairmont, B-4	Fairmont Gas E. & R. M. Co., Fairmont, Minn	....	50	.....	..	2	.....	..	K & G	Water	.....	.....	Own	Edison	.....	.....	.....	.....	.....	.....	.....
Garford	Garford Mfg. Co., Elyria, Ohio	600	16–62	30	..	..	Any	2	.....	.....	.....	Belt	.....	Gould	80	32	11	.....	Manual	.....	320
Genco, A	General Gas-Electric Co., Hanover, Pa	500	6–43	30	1	4	Own	2	Any	Water	Yes	Direct	Own	Own	110	32	16	S-Auto.	Auto.	.....	.....
B		600	10–59	30	1	4	Own	2	Any	Water	Yes	Direct	Own	Own	167	32	16	S-Auto.	Auto.	.....	.....
Jones, A	L. B. Jones Co., Kansas City, Mo	750	40	....	1	4	.....	.....	.....	Water	.....	Direct	.....	.....	.....	.....	.....	S-Auto.	Auto.	.....	.....
Lalley	Lalley Electro-Lighting Co., Detroit	1000	50	32	1	2	Own	1½	G	Water	.....	Direct	.....	Willard	115	32	16	Manual	Manual	Throttle	475
Lauson-Edison, 201	John Lauson Mfg. Co., New Holstein, Wis	800	7–30	50	1	4	Opt.	2½	Opt.	Water	Opt.	Belt	Own	Edison	38	50	26	Manual	Manual	Throttle	.....
202-30		1400	16–50	50	1	4	Opt.	2½	Opt.	.....	Opt.	Belt	.....	Edison	75	52	26	Manual	Manual	Throttle	.....
203–30		2000	22–75	50	1	4	Opt.	3½	Opt.	.....	Opt.	Belt	.....	Edison	112	52	26	Manual	Manual	Throttle	.....
206–110		3500	27–154	125	1	4	Opt.	4½	Opt.	.....	Opt.	Belt	.....	Edison	38	.....	94	Manual	Manual	Throttle	.....
Lauson Junior, 300		500	10–25	30	1	4	Opt.	1½	Opt.	.....	Opt.	Belt	Own	.....	40	30	15	Manual	Manual	Throttle	.....
301		800	15–40	30	1	4	Opt.	1½	Opt.	.....	Opt.	Belt	Own	.....	60	30	15	Manual	Manual	Throttle	.....
Langstadt-Meyer, 6	Langstadt-Meyer Co., Appleton, Wis	600	30–45	32	1	4	L-M	3	G	Water	Yes	Belt	L-M	.....	80	32	16	S-Auto.	Manual	Throttle	576
6½		1200	75	32	1	4	L-M	3	G	Water	Yes	Belt	L-M	.....	80	32	16	S-Auto.	Manual	Throttle	606
7		960	72	32	1	4	L-M	3	G	Water	Yes	Belt	L-M	.....	107	32	16	S-Auto.	Manual	Throttle	650
Main, 25-30 volt	Main Electric Mfg. Co., Pittsburgh, Pa	600	25–41	30	1	4	Own	1½	Opt.	Water	Yes	Belt	Own	.....	60	30	15	Manual	Manual	.....	375
40		800	40–56	30	1	4	Own	1½	Opt.	Water	Yes	Belt	Own	.....	95	30	15	Manual	Manual	.....	400
50		1000	50–66	30	1	4	Own	2½	Opt.	Water	Yes	Belt	Own	.....	95	30	15	Manual	Manual	.....	360
75		1500	22–97	30	1	4	.....	3½	Opt.	Water	Yes	Belt	Own	.....	130	30	15	Manual	Manual	.....	390
50		1000	25–75	110	1	4	.....	2½	Opt.	Water	Yes	Belt	Own	.....	40	110	55	Manual	Manual	.....	575
75		1500	38–113	110	1	4	.....	3½	Opt.	Water	Yes	Belt	Own	.....	60	110	55	Manual	Manual	.....	680
100		2000	60–160	110	1	4	.....	3½	Opt.	Water	Yes	Belt	Own	.....	95	110	55	Manual	Manual	.....	720
Marco	Marmon-Chicago Co., Chicago	1250	85–100	32	1	4	Newway	4	Opt.	Air	Yes	Chain	Dyneto	Perf't'n	.....	32	11	S-Auto.	.....	Electro-mag.	595
Matthews, A	Matthews Engineering Co., Sandusky, Ohio	1000	50	32	1	4	Own	3	G	Water	No	Direct	G-E	Willard	72	32	16	Auto.	Auto.	Electro-mag.	795
A-1		1000	50	32	1	4	Own	3	G	Water	No	Direct	G-E	Willard	72	32	16	S-Auto.	Auto.	Electro-mag.	695
B		2000	100	32	2	4	Own	7	G	Water	No	Direct	G-E	Willard	144	32	16	Auto.	Auto.	Electro-mag.	1,350
B-1		2000	100	32	2	4	Own	7	G	Water	No	Direct	G-E	Willard	144	32	16	S-Auto.	Auto.	Electro-mag.	1,250
C		1000	50	110	1	4	Own	3	G	Water	No	Direct	G-E	.....	.....	.....	.....	Manual	Manual	Electro-mag.	775
		2000	100	110	2	4	Own	7	G	Water	No	Direct	G-E	.....	.....	.....	.....	Manual	Manual	Electro-mag.	1,300
Mayhew, K 1	Mayhew Co., Milwaukee, Wis	800	12–40	32	1	4	.....	...	G	Water	Yes	Direct	Western	.....	80	32	16	S-Auto.	Manual	Flyball	475
K 2		800	16–48	32	1	4	.....	...	G	Water	Yes	Direct	Western	.....	125	32	16	S-Auto.	Manual	Flyball	510
K 3		800	22–54	32	1	4	.....	...	G	Water	Yes	Direct	Western	.....	160	32	16	S-Auto.	Manual	Flyball	550
Mor-Lite	Fairbanks, Morse & Co., Chicago	....	15–40	30	1	..	.....	...	G	Water	.....	Direct	.....	.....	.....	32	16	S-Auto.	Auto	Electro mag.	.....
Owen	R. M. Owen & Co., New York	1250	100	32	1	4	Own	1¼	G	Water	No	Direct	.....	.....	80	32	16	S-Auto	Auto.	.....	.....
Perfection, SA 1	Perfection Storage Battery Co., Chicago	1500	75	32	1	4	.....	3	Opt.	Water	.....	Direct	.....	Own	80	32	16	S-Auto.	Auto.	.....	600
FA 6		1500	65	32	1	4	.....	3	Opt.	Water	.....	Direct	.....	Own	40	65	32	Auto.	Auto.	.....	800
Powerlite, 163 L 65	Montgomery Ward & Co., Chicago	650	20	32	1	4	Own	2½	G	Water	Yes	Direct	Own	Own	60	32	16	S Auto.	Manual	Throttle	348
163-L-67		650	31	32	1	4	Own	2½	G	Water	Yes	Direct	Own	Own	90	32	16	S-Auto.	Manual	Throttle	365
163-L-69		650	41	32	1	4	Own	2½	G	Water	Yes	Direct	Own	Own	120	32	16	S-Auto.	Manual	Throttle	380
Rohaco, Unit	Roberts-Hamilton Co., Minneapolis, Minn	1500	75	32	1	4	Own	3	Opt.	Water	Yes	Direct	.....	Opt.	75–100	32	16–24	S-Auto.	Manual	Flyball	.....
A-1		500	13–40	40	1	4	Own	1½	Opt.	Water	Yes	Belt	.....	.....	60	30	15	S-Auto.	Manual	Flyball	*250
BE-1		800	30	50	1	4	Own	2	Opt.	Water	Yes	Belt	.....	Edison	75	50	24	S-Auto.	Manual	Flyball	*500
BE-2		1400	32–80	50	1	4	Own	3	Opt.	Water	Yes	Belt	.....	Edison	113	50	24	S-Auto.	Manual	Flyball	*600
B-3		2000	24–120	40	1	4	Own	5	Opt.	Water	Yes	Belt	.....	.....	120	32	16	S-Auto.	Manual	Flyball	*490
BE-3		2000	100	50	1	4	Own	5	Opt.	Water	Yes	Belt	.....	Edison	150	50	24	S-Auto.	Manual	Flyball	*750
Swanlite	Black Swan Co., Waseca, Minn	1000	50–100	....	1	4	Own	3	Opt.	Water	No	.....	.....	.....	60–100	32	16	.....	.....	.....	385–465
Swartz-Unit	Swartz Electric Co., Indianapolis, Ind	1000	50	30	1	2	Own	...	G	Water	No	Direct	Own	Opt.	88	32	16	S-Auto.	Manual	Electro-mag.	.....
E		1500	50	30	1	4	Own	...	Opt.	Water	Yes	Belt	Own	Opt.	88	32	16	Manual	Manual	Flyball	.....
F		2000	100	60	1	4	Own	...	Opt.	Water	Yes	Belt	Own	Opt.	88	64	32	Manual	Manual	Flyball	.....
Uni-Lectric	Uni-Lectric Corp., Detroit	660	33	110	1	..	Own	.....	.....	Water	.....	Direct	Own	.....	80	6	3	S-Auto.	.....	.....	472
Universal, 1-KW	Universal Products Co., Oshkosh, Wis	1000	150	32	1	4	Own	...	G	Water	.....	Direct	.....	.....	80-130	32	.....	S-Auto.	Auto.	.....	435-495
4-KW		4000	200	32	1	4	Own	...	G	Water	.....	Direct	.....	.....	130	32	.....	S-Auto.	Auto.	.....	975
West. Elect., 15-DC-90	Western Electric Co., New York	1500	75	32	1	..	Own	3¼	K	Air	Yes	Direct	Own	.....	90	32	16	S-Auto.	Auto.	Throttle	.....
15-DC-180		1500	100	32	1	..	Own	3¼	K	Air	Yes	Direct	Own	.....	180	32	16	S-Auto.	Auto.	Throttle	.....
Winton	Winton Eng. Works, Cleveland, Ohio	5000	250	115	4	4	Own	.....	.....	Water	.....	Direct	Own	Opt.	Opt.	Opt.	Opt.	.....	.....	.....	.....
Wisconsin, 15-light	Lauson-Lawton Co., De Pere, Wis	450	12	30	1	..	Own	2½	.....	Water	Yes	Belt	Own	.....	36	26	13	Manual	Manual	.....	.....
30-light		600	24	32	1	..	Own	2½	.....	Water	Yes	Belt	Own	.....	36	32	16	Manual	Manual	.....	.....
50-light		800	40	32	1	..	Own	2½	.....	Water	Yes	Belt	Own	.....	60	*32	16	Manual	Manual	.....	.....
100-light		1500	80	32	1	..	Own	4	.....	Water	Yes	Belt	Own	.....	100	32	16	Manual	Manual	.....	.....

*Without engine. Opt., optional. S-Auto., semi-automatic. K, kerosene. G, gasoline. Electro-mag., electro-magnetic.

Service Equipment

Time Savers of the Shop

Electric Valve Grinder

THE Stenman tool is designed to grind a set of eight valves in approximately 20 min. It may be plugged in on any lamp socket, either direct or alternating current, and is regularly furnished for 110 and 130 volts. It can be supplied for higher voltages, if required, by its maker, the Stenman Electric Valve Grinder Co., Inc., Worcester, Mass.

New Color Assortments

Two new color assortments of the Peerless color finishings have been brought out for 1919 by the Columbus Varnish Co., Columbus, Ohio. These color assortments are packed in a case with advertising literature and catalogs. The No. 1 assortment gives 1 pt. and 1 qt. of each of the eight colors, and the No. 3 assortment gives 3 pt. and 3 qt. of each of the eight colors.

Electric Valve Grinder

The B. F. S. is a portable motor-driven valve grinder which gives an oscillating motion to the valves at a speed of 700 oscillations a minute. The oscillation is five-sixteenths of a turn. Several bits for different-type valves are furnished with each grinder, and these can be changed quickly simply by removing a pin. The thrust is taken by ball bearings. Standard equipment provides for 110 to 130 volts, alternating, direct or universal. It is made in two sizes, the baby valve grinder with 1/37-hp. motor, length 11 in., price $35, and a heavy-duty valve grinder with 1/12-hp. motor, length 12 in., price $45. Special attachments for grinding Buick and Franklin valves are $1 extra each. The maker is the B. F. S. Mfg. Co., 54 Hermon street, Worcester, Mass.

Engine Stand for Fords

A light, simple, adjustable stand for Ford engines is made by K. R. Wilson, Buffalo, N. Y. The base and uprights are of cast gray iron, the engine clamps being channels. Three holes are drilled in the channels so the Ford engine can be bolted to them, and these channels swivel, so the engine can be placed at any angle and then locked in this position. The whole stand is mounted on large castors so that it can be moved about easily. The weight is 100 lb., crated for shipment, and the price $20.

Portable Work Benches

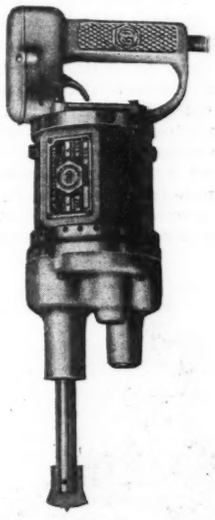
Two sizes of portable work benches are put out by the United Engine & Mfg. Co., Hanover, Pa. No. 1, which is amply strong and large enough for all light repairs, is intended to be used any place in the garage, and on account of its size and compactness easily and quickly can be pushed to the car. No. 2 is a bench for heavy work. This is principally for the repair-shop where it will take the place of the stationary benches for about 75 per cent of the work usually done on them, even though they are at quite a distance from the car. No. 1 is 34 in. high, has a top 13 by 44 in., is 22 in. wide at the bottom and weighs 150 lb. No. 2 also is 34 in. high, but it has a top 2 in. thick and 20 by 60 in., with three compartments on each end, 18 by 12 by 7 in., and weighs twice as much.

B. & D. Valve Grinder

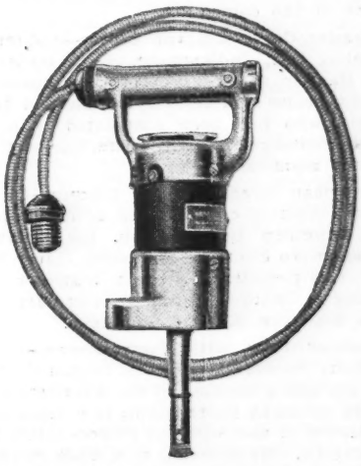
The Black & Decker Mfg. Co., Baltimore, Md., has brought out a new electric valve grinder. The spindle oscillates with a long, steady sweep similar to the movement obtained in grinding by hand but many times more rapidly and the patented Black & Decker pistol grip and trigger switch is embodied, making it possible to operate and control the grinder in a convenient manner. A 1/6-hp. motor is used, which is air-cooled. It operates on standard power circuits, either alternating current with range 25 to 60 cycles or direct current, being made for circuits of 110, 220 and 32 volts. The motor and gearing with reciprocating mechanism are inclosed in an aluminum housing, the gearing and oscillating movement being separated from the motor compartment and packed in grease. The grinding spindle runs in a ball thrust bearing. The armature shaft runs on Norma ball bearings, and the gears are mounted on shafts ground to size supported at both ends in long phosphor-bronze bushings. Bits are provided to make the tool adaptable to various types of valves. The price is $45.

Gear Pin Riveting Jig

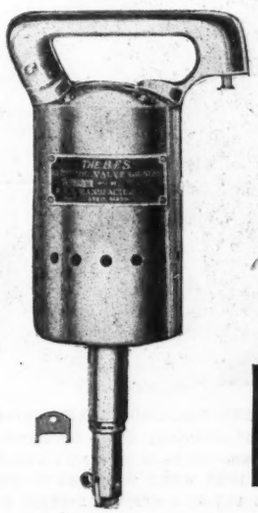
A small jig for riveting the pins of the Ford triple gear is made by K. R. Wilson, Buffalo, N. Y. It consists of a hemispherical anvil fitted with a bolt and wing nut to hold the triple gear in place. On the top of the anvil are eight shallow holes which allow the pins to protrude slightly when riveting the first side, so that when the gear is turned over there will be sufficient length of pin to form a head on the other side. The price is $4.



B. & D. new electrical valve grinder



Stenman electric valve grinder



B. F. S. valve grinder

Columbus color assortment No. 1

Without engine. Opt., optional. S-Auto., semi-automatic. K, kerosene. G, gasoline. Electro-mag., electro-magnetic.

Among the Makers and Dealers

Short Trade Notes

ATTERBURY Capital Is Doubled—The Atterbury Motor Car Co., Buffalo, N. Y., has increased its capital from $250,000 to $500,000, to increase production facilities.

Bower Surplus $299,073.55—The Bower Roller Bearing Co. reports a surplus account of $229,073.55 for the company as of Jan. 1 last. The capital stock is $600,000.

Dividend Declared by Goodyear—The Goodyear Tire & Rubber Co. has declared a regular quarterly dividend of 3 per cent on the common stock, payable March 1 to stock of record Feb. 15.

Hebb Declares Dividends—The Hebb Motors Co., Lincoln, Neb., has declared a 7 per cent quarterly dividend on preferred and 10 per cent on common. The capital of the company has been increased from $1,250,000 to $2,500,000.

Fisher Back with Standard—F. J. Fisher has been released from the service and has resumed his duties as secretary and treasurer of the Standard Motor Truck Co., Detroit. He was an officer in the Motor Transport Corps.

Gloetzner Takes on New Duties—A. A. Gloetzner has been elected vice-president of the Covert Gear Co., Inc., of Detroit. He will also retain his present duties as chief engineer and manager of sales.

Hupmobile Promotes Sides—Fred B. Sides has been appointed assistant sales manager of the Hupp Motor Car Corp. He joined this company in 1915 as office manager, and his promotion is in line with the advancement policy of the company.

Hassler Opens Chicago Offices—Robert H. Hassler, Inc., Indianapolis, Ind., maker of the Hassler shock absorber, has opened a Chicago sales and service station and H. S. Quick, who has been associated with the Hassler concern for many years, has been appointed manager.

American Bronze Elects Officers—At the annual meeting of the board of directors of the American Bronze Corp. the following officers were elected: President, Harry Porter; vice-president, general manager and treasurer, Mathew Ditman; secretary and sales manager, Edward Anderson.

Spencer Now with Pierce-Arrow—C. H. Spencer, formerly with the Packard Motor Car Co. and a member of the automotive industry for many years, acting in various sales capacities, is now with the Pierce-Arrow Motor Car Co. He is acting as a trade research expert, analyzing trade conditions in various territories.

Toledo Firm Changes—The Toledo Double-Tread Tire Co., Toledo, Ohio, has changed its name to the Lincoln Tire & Rubber Co. The company plans on doing a general tire business in addition to its double-tread work. The building next to the present quarters has been leased, and the two places are being converted into one establishment.

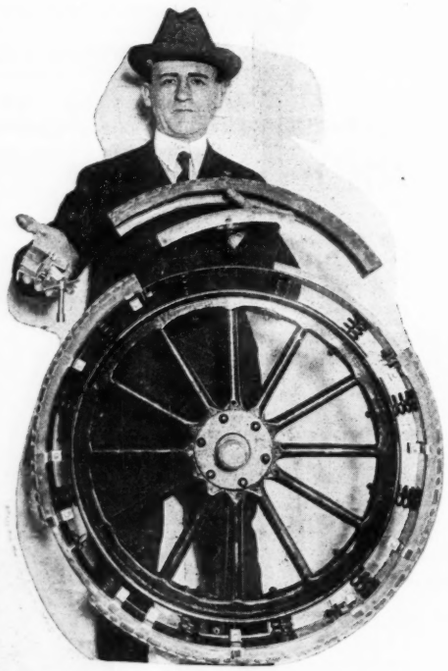
Waddell Back with Chevrolet—Capt. Albert G. Waddell, who recently returned from France, where he commanded a battery of French 75's, has resumed his duties at the Oakland factory of the Chevrolet Motor Co. Captain Waddell, who was well known on the Pacific Coast as a member and representative of the A. A. A. Contest Board before joining the Chevrolet organization, has been absent from his desk for almost two years. He was one of the first men in the industry in California to enter the service after the outbreak of the war.

Fewell Is Stan-Par S. M.—W. B. Fewell has been made sales manager of the Stan-Par Axle division of the Standard Parts Co. Mr. Fewell was originally a General Motors man and has been identified with the trade for many years in connection with both complete cars and parts.

Johns-Manville Distributes Bonus—The H. W. Johns-Manville Co. will distribute to all its salaried employees who were in continuous service for the full year 1918 20 per cent on the salaries paid them during that year. The company also did this for 1917. The extra compensation for 1918 will cost approximately $1,000,000.

Coe Made Anderson Vice-President—Charles F. Coe has been elected vice-president and general sales manager of the Anderson Motor Co., Rock Hill, S. C. Up to within two weeks ago he was manager of the Chevrolet Motor Co. of New England with headquarters in Boston. He assumes his new duties March 1.

Toledo Firm to Triple Capacity—The Toledo Screw Products Co. has purchased a part of the old Ohio Electric Co. plant and 300 feet in addition and will move into the new location within ninety days. The extra space acquired will be used later for additions. The new plant permits the company to triple its production. The last war contract will be closed shortly and within a month the company expects to be working entirely on screw machine products for its commercial trade.



A PUNCTURELESS TIRE—James A. Horne, of Denver, Col., perfected the tire shown. It is contrived in sectional parts so that when one part of the tire becomes out of order the section can be replaced with a new one. The sections can be carried in the ordinary tool box

Hardig Now with United Motors—J. H. Hardig, formerly advertising manager of the Remy Electric Co., has been appointed assistant advertising manager of the motor equipment division of the United Motors Corp., Detroit.

Kelly-Springfield Opens Branch—The Kelly-Springfield Tire Co. has opened a branch house in Toledo, Ohio. Charles E. Ball, formerly of the Cleveland branch, is general manager and H. H. Pierce, also Cleveland, is office manager.

Maxim Places Tractor Territory—J. C. Davis of Davis Brothers, spike manufacturers, Philadelphia, Pa., has been appointed distributer for Pennsylvania, Delaware, New Jersey east of New Brunswick and eastern Maryland, of the Maxim tractor and Maxim-Dart truck made by the Maxim Munitions Corp., New York.

Vogler with Service Truck—Capt. H. J. Vogler, late of the Army, has been appointed district sales manager of the Service Motor Truck Co. His territory includes Maryland, the District of Columbia and the Carolinas. While in the army Captain Vogler was in charge of the Handley-Page airplane production.

Standard Tool Getting Back—The Standard Tool & Mfg. Co. is getting back to peacetime production and is now running at 75 per cent capacity. This concern specializes on tubular products, drawn work and stampings, and has been engaged at its full capacity on war work up to the signing of the armistice. The company reports considerable buying activity on the part of the big motor-car companies.

Frost Gear to Enlarge Plant—The Frost Gear & Forge Co. has increased its capital stock from $350,000 to $750,000 and approved plans for a large addition to its present plant. The new building will be erected south of the main plant. The addition will be of steel construction, 75 by 150 ft., with concrete basement. The heat treating department will be located in the new building. All old officers and directors were re-elected.

Baldwin with United Motors—George C. Baldwin, formerly with the Saxon Motor Car Corp., has been appointed field manager for the United Motors Service, Inc. This position includes the distribution of technical information and records, advertising and supervision of all branches and authorized distributors. Besides his connection with the Saxon Motor Car, Mr. Baldwin has been service manager for the Cadillac Motor Car Co. and the Studebaker Corp.

Reeke Expands Place of Business—The Alfred Reeke Co., Milwaukee, Wis., distributer of the Nash in Wisconsin and Upper Michigan, has acquired the adjoining building, providing a total of 53,500 sq. ft. of floor space. The original location will be used exclusively for the passenger car department, and the new quarters, embracing 30,000 sq. ft., to the motor truck department. M. J. Monson, formerly manager of the Milwaukee branch of the Buick Motor Co., has become manager of wholesale truck sales, and Roy W. Osborn, secretary of the company, will handle

retail truck sales. Henry M. Vogel, vice-president, will have general supervision of both departments. Alfred Reeke is president and general manager.

Lever Is Denby District Manager—J. W. Lever is now district manager of the Denby Motor Truck Co., Detroit. His territory is Oklahoma and Texas.

Tractor Dealers Will Organize—Organization of a tractor dealers' association at Sioux Falls, S. D., is under way, with the object of holding a tractor show and demonstration soon.

Sloan Now with Mitchell—E. L. Sloan, district sales manager for the Reo Motor Car Co., Lansing, Mich., and identified with that company for ten years, has accepted a similar position with the Mitchell Motors Co., Racine, Wis.

Olfs to Represent—A. C. Olfs, formerly eastern representative of the Titanium Bronze Co., has been appointed Michigan representative for the Stewart Mfg. Corp., Chicago, maker of die castings, with headquarters at Detroit.

Inland Hold Sales Convention—The Inland Machine Works, St. Louis, Mo., recently held a convention of its sales force, which lasted for three days and ended with a banquet at the Statler hotel. Salesmen from all parts of the country were present.

Haskins Returns to Federal—E. H. Haskins is again with the Federal Motor Truck Co. He has been absent about a year, during which time he helped design the standardized truck for postal service, adapted for rural motor express and parcel post work.

Young Now with Perfex—Lieut. Fred M. Young, U. S. Air Service, has returned from overseas duty and is now associated with the Perfex Radiator Co., Racine, Wis., as sales engineer. Mr. Young has made radiators and engine cooling a study for the last seven years.

Richardson Opens Chicago Office—Capt. Carl V. Richardson has opened an office in Chicago and will specialize on consultations and designs of internal combustion engines, tractors, and trucks. Previous to army service, he was experimental engineer with the Parrett Tractor Co. and designing engineer with the Buda Co.

Winther Now Located in Kenosha—The Winther Motor Truck Co. has completed the removal of its main works and general offices from Winthrop Harbor, Ill., to Kenosha, Wis., and resumed operations with the loss of only a few days. The new plant is located in North Kenosha and represents an investment of $150,000 in buildings and equipment. Virtually the entire removal was conducted by Winther trucks.

Carlisle Cord Tires on Peace Basis—At the annual meeting of the Carlisle Cord Tire Co., Feb. 4, the following officers were elected for the year: President, J. S. Brotz; vice-president, C. A. Gilbert; treasurer, Lewis H. Homer; secretary, F. R. Serles; assistant secretary and treasurer, C. V. Tuthill. Since the company has been relieved from war contracts, its factory has been working continuously to make up on production.

Fire Wrecks Wilson Body Plant—The five-story brick assembly plant of the C. E. Wilson Body Co. in Detroit burned to the ground recently. The loss, estimated at between $400,000 and $500,000, is covered by insurance. Lightning during a thunder storm is believed to have caused the fire which started on the loading platform. Production will not be greatly handicapped, vice-president George D. Wilson avers. About 400 men are made idle by the blaze but arrangements are being made to transfer them to the other plants of the company. The press and tool room will be in working order in a few days. Assembly work will be shifted to other building units, and the big plant will be operating normally again in a week or ten days.

Travis with the Owen Tire—O. L. Travis has been appointed sales manager of the Owen Tire & Rubber Co., Bedford, Ohio.

Williams Is Truck Sales Manager—Birkett L. Williams has been appointed sales manager of the truck department for the Grant Motor Car Corp.

Westlake Is Eastern Sales Manager—W. A. Westlake has been appointed eastern sales manager of the truck tire department of the McGraw Tire & Rubber Co., New York.

Cooper Rubber Opens New Branches—The rapid growth of the I. J. Cooper Rubber Co., Cincinnati, Ohio, has made it necessary to open new wholesale distributing branches in Cleveland, Ohio; Toledo, Ohio; Nashville, Tenn., and Memphis, Tenn.

Aument Opens Consulting Offices—Carroll M. Aument, formerly one of the engineers of the Wright-Martin Aircraft Corp., has resigned his position and opened a consulting, designing and sales engineering office under the name of Aument & Gillespie, New York.

Goodrich Vice-President Back—Lieut. A. B. Jones, vice-president of the B. F. Goodrich Rubber Co., who has just returned home, left here in August to take charge of the motor transport work of the Red Cross in France, when it formed its own department to handle its supplies. In October Colonel Jones succeeded Col. Harvey Gibson as commissioner for France, when Colonel Gibson was made chairman of the Commission for Europe.

Townsend Will Add to Plant—The Townsend Mfg. Co., Janesville, Wis., maker of gas and kerosene engines and tractors, will break ground in a few days for a plant addition to provide much-needed capacity for the manufacture of tractors. The capital stock was increased from $125,000 to $175,000 at the annual meeting a short time ago to finance the expansion of the production and trade. The present output is one tractor a day, and this is to be doubled.

Large Sales and Service Space—The Meyer Motor Car Co., Inc., Buffalo, N. Y., will erect one of the largest salesrooms and service stations in New York state. The company's property extends over a 72 ft. frontage with a depth of 350 ft. and also has a 100-ft. frontage on a second street. The purchase price is said to have been in the neighborhood of $135,000. Two buildings will be erected, one 72 by 125 ft. and the other 80 by 225 ft. A total space of 40,000 sq. ft. will be provided.

National Tire & Rubber Insures Employees—The National Tire & Rubber Co. has presented each of its employees with a life insurance policy paid entirely by the company and increasing automatically as the employee's term of service increases. It provides for the payment of the full amount of the policy to the beneficiary in case of death of an employee, and in case of permanent disability the full amount of the policy will be paid in monthly installments. The policy also may be transferred and continued by the holder after leaving the employ of the company.

New Sales Organization—The Miller-Cave Corp., a new selling organization, has opened offices in Chicago for service to manufacturers as sales representative to the automotive industry. Franklin A. Miller, president and general manager, was with the Stromberg Carbureter Co. for several years in the sales department and later as advertising manager. Robert R. Cave, vice-president, recently returned from Government service as a divisional procurement officer. C. E. Sedwick, secretary and treasurer, also has just returned from a captaincy in the Army Transport Division. This new concern will travel men throughout the central west, calling on the manufacturers of passenger cars, trucks and tractors, as well as the accessory jobbers.

Brogan with Black & Decker—Graham W. Brogan is now advertising manager of the Black & Decker Co. He was formerly with the Duesenberg in charge of advertising.

Lininger Adds Tractor to Line—The Lininger Implement Co., Omaha, Neb., has added to its sales line the tractor manufactured by the Turner Simplicity Co., Port Washington, Wis.

Williams Becomes U. M. A. M.—G. W. Williams, Jr., has resigned from the bureau of aircraft production to become advertising manager of the United Motors Service, Inc., Detroit.

Rogers Joins Anderson Company—E. D. Rogers has joined the staff of the Anderson Motor Co., Rock Hill, S. C., as southwestern district sales manager with headquarters at Dallas, Tex.

Stevens to Corbitt Motor Truck Co.—G. C. Stevens, formerly with the Chicago Pneumatic Tool Co., has resigned to accept the position as eastern sales manager with the Corbitt Motor Truck Corp., Henderson, N. C.

Caywood to Black & Decker—D. G. Caywood, formerly sales manager of the Brunner Mfg. Co., of Utica, N. Y., is now special representative of the Black & Decker Co., Baltimore, Md. He will carry on the field work of the company in the distribution of the company's products.

Firestone Steel Products Adds to Personnel—A. D. Droeger has been made manufacturer's representative of the Firestone Steel Products Co. C. W. Flick, formerly with the Mason Tire & Rubber Co., is in charge of the eastern territory of the company. J. C. Baily assumes charge of the western territory.

Promotions in Pennsylvania Rubber—At a special meeting of the board of directors of the Pennsylvania Rubber Co., George Daum was elected second vice-president in charge of production, A. H. Price was elected second vice-president in charge of sales development, James Q. Goudie was elected general sales director in charge of branch sales with headquarters at Detroit.

Maltby with Philadelphia Paige—A. E. Maltby has resigned as branch manager of the Winton company, effective March 1, when he becomes vice-president and general manager of the Bigelow Willey Co., Philadelphia, Pa., distributer of Paige cars and trucks. Maltby is a pioneer in the local trade, serving his third term as president of the Automobile Trade Association and also as director of the national body.

Omaha Dealers 100 Per Cent—Membership of Omaha, Neb., dealers in the Omaha Automobile Trade Association is virtually 100 per cent, says Clarke G. Powell, secretary-treasurer, in reporting the following new members: Mid-City Motor and Supply Co.; Omaha Liberty Auto Co.; Keystone Motors Corp.; Apperson-Nebraska Motor Co.; Truck & Tractor Co.; Hansen-Tyler Auto Co.; C. J. Dutton Automotive Co.; Tate-Morton-Holmes Company.

Swinehart Declares Extra Dividend—The Swinehart Tire & Rubber Co. has declared a dividend of 2 per cent payable April 15 to stock of record March 31, also an extra of 10 per cent in preferred stock on common March 5 to stock of record Feb. 20. These are the first dividends on common stock authorized since Oct. 15, 1917. It comes as result of big earnings made the last year and the general financial improvement of the company. Sales in 1918 amounted to $3,910,000, an increase of 100 per cent over those of 1917. Net earnings, it is said, after liberal allowances, amounted to $500,000.

From the Four Winds

Glimpses at the World of Motordom

CADILLAC Has Big Honor Roll—A complete record has not been made of the number of Cadillac men who entered the service of the Army and Navy and those who made the supreme sacrifice, but from the factory alone more than 1200 gave their services to Uncle Sam.

Hartford Dealers Get Together—In future any Hartford dealer who desires to take on another car than that he is representing will have to go before the board of governors, provided the car is represented at the time by another dealer, or he must at first make certain the other dealer is willingly passing up the representation. The dealers adopted resolutions along these lines, which indicates that the general feeling among the agents is better than it has ever been before. This special action was taken by reason of the experience of two members of the association who have lost their agencies of late. In one case it was the opinion that the dealer was at fault, and in the other that things had been misrepresented to the dealer. Heretofore the dealers have not got together only enough to talk over the show plans, to hear reports of the show committee and to draw down their dividends. The real spirit is gaining rapidly and the car agents are pulling together in a body.

Toledo Favors Higher License—Toledo Motor Club members favor increasing the license fee provided the additional revenue will be used for road building. The club has endorsed the bill drawn by the Ohio Good Roads Association, to be presented to the state legislature, which provides a graduated license tax based on weight and horsepower of the machines running from $10 on Ford to $75 on heavy trucks.

Wisconsin Would Raise Speed Limit—Wisconsin motorists and dealers have put their strength behind a movement to induce the 1919 session of the Wisconsin Legislature to raise the speed limit of motor cars on country roads from 25 to 30 m. p. h. It is pointed out that there is much less danger of driving a car at 30 m. p. h. to-day than it was to drive 25 m. p. h. in the days when the present limit was fixed. No effort will be made to increase the present limit of 15 m. p. h. as the maximum speed within city or village limits.

Roads Kept Clear for Trucks—Motor truck operators, especially those who travel long distances, are finding things very much in their favor this winter, in Connecticut anyway. There has been but one fall of snow and that promptly disappeared. The state highway department has been able to keep right along with the work of repairing the main arteries, so the roads are in much better shape than is generally the case at this season of the year. On the cross-roads, where many trucks travel and which become rutted after the heavy rains and then freeze hard, have been vastly improved by scraping. The highway department's trucks have been especially busy in this respect this winter.

Car Maker Is Not Held Liable—A car owner of Schenectady, N. Y., was overturned by reason of the steering gear giving way and was injured so that he brought suit against the maker, Metz, claiming $25,000 damages, which was contrary to custom. The attorney, Clinton Noble, states that previous to the time of the motor car manufacturers were not liable for damages by reason of any fault in the articles manufactured, only in the cases of inherently and imminently dangerous instruments, like guns and so on, and that vehicles did not come in this class, but since the car the courts have somewhat reversed themselves and hold as to then the manufacturer is liable. Manufacturers have lost several cases of the kind in New York, prominent among them the case of McPherson vs. Buick, and the Metz case is perhaps about the only case won before a jury to this time. It developed that the defect was not a faulty and latent defect but the giving way was caused by the plaintiff's abuse of the car and the part in question.

Ontario Plans 5,000 Miles of Roads—Ontario is planning to build 5000 miles of improved highways in the province as part of the government's plan to avoid an oversupply of labor now that the war is over. Practically every county has endorsed the plan. Ontario has guaranteed to pay approximately half the outlay. The province has decided upon a system of provincial highways, the longest of which is the 600-mile stretch from Windsor to the Ottawa river. This main road will pass through London, Hamilton, Toronto and Kingston. Another trunk road will lead from Hamilton to Niagara Falls so that Detroiters will have almost a direct road line to Buffalo. It has also just been announced that the Ottawa-Prescott highway, an important road 70 miles from the Canadian capital to the St. Lawrence river, has been declared a provincial main highway. This road will link up with the trunk road extending from Windsor to the Ottawa river and also will provide another outlet to New York state. The Windsor-Ottawa road will link up with the perfected road already in use between Montreal and Quebec. When Ontario finishes this highway there will be a permanent roadway from Detroit to the Gulf of St. Lawrence. All returned soldiers are to be given an opportunity of working on roads in Ontario until normal conditions are restored.

Coming Motor Events

SHOWS

Hartford, Conn.	Automobile Dealers' Association	Feb. 22-March 1
Springfield, Mass.	Cars and trucks	Feb. 24-March 1
Kansas City, Mo.	Motor Dealers' Association, cars	Feb. 24-March 1
Kansas City, Mo.	Kansas City Tractor Club, tractors	Feb. 24-March 1
Portland, Ore.	Dealers' Motor Car Association	Feb. 24-March 1
Cedar Rapids, Iowa		Feb. 24-March 1
Burlington, Iowa		Feb. 24-March 1
Duluth, Minn.		Feb. 25-March 1
Madison, Wis.	Association of Commerce	Feb. 26-March 1
Quincy, Ill.	Automobile Trades Association, cars	Feb. 26-March 1
Detroit	Automobile Dealers' Association	March 1-8
Quincy, Ill.	Automobile Trades Association, trucks and tractors	March 3-4
Columbus, Ohio	Automobile Show Co.	March 3-8
Richmond, Va.	Automobile Trade Association	March 3-8
Buffalo, N. Y.	Automobile Dealers' Association	March 3-8
Worcester, Mass.	Automobile Dealers' Association	March 3-8
Little Rock, Ark.	Automobile Dealers' Association	March 5-8
Dayton, Ohio		March 3-9
Philadelphia, Pa.	Automobile Trade Association, cars	March 8-15
Omaha, Neb.	Automobile Trade Association, automotive	March 10-15
Syracuse, N. Y.	Automobile Dealers' Association	March 10-15
Salt Lake City, Utah.	Salt Lake Auto Show	March 10-15
Peoria, Ill.		March 12-15
Boston, Mass.	Automobile Dealers' Association, cars	March 15-22
Harrisburg, Pa.	Motor Dealers' Association	March 15-22
Peoria, Ill.		March 17-18
Philadelphia, Pa.	Motor Truck Association, trucks	March 17-22
St. Joseph, Mo.	Automobile Show Association	March 19-22
Brooklyn, N. Y.	Motor Vehicle Dealers' Association, cars	March 22-29
Warren, Pa.	Automobile Dealers' Association	March 22-29
Trenton, N. J.	Auto Trade Association	March 22-29
Pittsburgh, Pa.	Automobile Dealers' Association	March 22-29
Utica, N. Y.	Motor Dealers' Association	March 24-29
Brooklyn, N. Y.	Motor Vehicle Dealers' Association, trucks	April 1-5
Montreal, Canada	Soldiers' Wives' League	April 5-12
Bridgeton, Conn.	Automobile Dealers' Association	April 5-12
Deadwood, S. D.	Deadwood Business Club	April 8-12

SHOW DATES INDEFINITE

Bridgeport, Conn.	City Battalion	Not Decided

MEETINGS

New York	American Road Builders' Association	Feb. 25-28
Hot Springs, Va.	Automotive Equipment Association	June 2-6

RACES

Santa Monica, Cal.		March 15
Uniontown, Pa.		May 17
Indianapolis, Ind.	500-Mile Sweepstakes	May 31